

CELMN-PD-RN

**US Army Corps
of Engineers**
New Orleans District

**CULTURAL RESOURCES REPORT FOR MISSISSIPPI
RIVER-GULF OUTLET NEW LOCK AND
CONNECTING CHANNELS**

Final Report

December 1997

EARTH SEARCH, INC.
P.O. Box 850319
New Orleans, LA 70185-0319

DTIC QUALITY INSPECTED 4

Prepared for

U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267

19980423 024

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

REPORT DOCUMENTATION PAGE

FORM APPROVED
OMD NO. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified			1b. RESTRICTIVE MARKINGS Not Applicable		
2a. SECURITY CLASSIFICATION AUTHORITY Not Applicable			3. DISTRIBUTION/AVAILABILITY OF REPORT Unclassified. Distribution is unlimited.		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE Not Applicable					
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION Earth Search, Inc.		6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION U.S. Army Corps of Engineers, New Orleans District		
6c. ADDRESS (City, State and ZIP Code) P.O. Box 850319 New Orleans, LA 70185-0319			7b. ADDRESS (City, State, and ZIP Code) P.O. Box 60267 New Orleans, LA 70160-0267		
8a. NAME OF FUNDING/SPONSORING		8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION DACW29-94-D-0020, D. O. 16		
8c. ADDRESS (City, State, and ZIP Code)			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO. Not applicable	PROJECT NO. -----Civil-----	TASK NO. -----Works-----
11. TITLE (include Security Classification) Cultural Resources Report for Mississippi River - Gulf Outlet New Lock and Connecting Channels					
12. PERSONAL AUTHOR (S) Rhonda L. Smith, Benjamin Maygarden, Roger T. Saucier, and Melissa Braud					
13a. TYPE OF REPORT Final		13b. TIME COVERED FROM 1996 TO 1996		14. DATE OF REPORT (Year, Month, Day) December 1997	
15. PAGE COUNT 66					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Mississippi River - Gulf Outlet (MRGO). Intra-coastal Waterway (ICWW). Orleans Parish, geomorphology, geoarcheology, plantations, eastern New Orleans, aerial photographs		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) Background research was conducted for a temporary area for the construction of components of the Mississippi River - Gulf Outlet (MRGO) new lock in Orleans Parish. This research included a review of historic maps, documents, and aerial photographs. The geomorphic and geologic history of the project area was reviewed, particularly as it pertains to the geoarcheological predictions for the project area. No fieldwork was undertaken. From the available data, it was concluded that construction in the project area is unlikely to impact any archeological deposits. No further work was recommended for the project area. However, should unanticipated archeological remains be encountered during construction, examination by an archeologist is recommended.					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> FOR USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL Dr. Edwin Lyon			22b. TELEPHONE (Include Area Code) (504) 862-2038		22c. OFFICE SYMBOL CELMN-PD-RN

ACKNOWLEDGMENTS

Dr. Jill-Karen Yakubik served as Principal Investigator for this research. Ms. Rhonda L. Smith served as Project Manager. Mr. Benjamin Maygarden, Historian, prepared the historical overview. Dr. Roger T. Saucier served as Geomorphologist for the project. Ms. Melissa Braud summarized previous archeological investigations in the vicinity of the project area.

TABLE OF CONTENTS

CHAPTER 1	
INTRODUCTION	1
CHAPTER 2	
GENERAL GEOLOGICAL AND GEOMORPHOLOGICAL SETTING	
AS RELATED TO CULTURAL RESOURCES	3
Geographic and Physiographic Setting	3
Purpose and Scope of the Chapter	3
Geologic Framework and Controls	4
Regional Stratigraphy and Geomorphic Processes	4
Site Stratigraphy	8
Geologic History	10
Geoarchaeological Considerations	12
CHAPTER 3	
NATURAL SETTING	13
Introduction	13
Climate	13
Plant Communities	13
Fish	14
Birds	15
Mammals	15
CHAPTER 4	
ABORIGINAL OCCUPATIONS IN SOUTHEASTERN LOUISIANA	17
The Poverty Point Period (1500 B.C. to 500 B.C.)	17
The Tchula Period (500 B.C. to A.D. 0)	17
The Marksville Period (A.D. 0 to A.D. 300)	17
The Baytown Period (A.D. 300 to A.D. 700)	18
The Coles Creek Period (A.D. 700 to A.D. 1000)	18
The Mississippi Period (A.D. 1000 to A.D. 1700)	18
Aboriginal Occupation during the Colonial Period	18
CHAPTER 5	
HISTORIC OVERVIEW	21
Introduction	21
The Colonial Period to 1803	21
The Antebellum Period: 1803-1861	23
The Late Nineteenth Century: 1860-1900	27
The Twentieth Century	28
CHAPTER 6	
PREVIOUS INVESTIGATIONS	35
Gagliano et al. (1975)	35
Weinstein et al. (1980)	35
Coastal Environments, Inc. (1981)	36
Wiseman et al. (1981)	36
Thomas (1982)	37
Pearson (1984)	37

Table of Contents, Continued.

CHAPTER 7
REVIEW OF AERIAL PHOTOGRAPHS 39

CHAPTER 8
SUMMARY AND RECOMMENDATIONS 41

REFERENCES CITED 43

APPENDIX I
SCOPE OF SERVICES 49

LIST OF FIGURES

Figure 1. Excerpt from the Little Woods (1967, Revised 1994), LA 7.5' quadrangle showing the study area.	2
Figure 2. Idealized distribution of depositional environments and soil types in the vicinity of New Orleans. From Kolb and Shockley (1959).....	5
Figure 3. Major elements in the subsurface geology of the New Orleans area. From Kolb, Smith, and Silva (1975).....	6
Figure 4. Configuration of the top of the western half of the Holocene-age Pine Island Beach Trend buried beneath deltaic deposits in the greater New Orleans area. From Saucier (1994).	9
Figure 5. Excerpt from <i>Map Shewing [sic] The Landing Of The British Army</i> by A. Latour (Latour 1815). Bayou Sauvage, the "Chefmenteur Road," and the plantations of G. Dreux and B. Lafon are indicated near the top of the figure.	24
Figure 6. Excerpt from the 1892 U.S. Geological Survey <i>Chef Menteur</i> and <i>St. Bernard</i> sheets (From Pearson 1984:16). The bend in Bayou Sauvage in the upper portion of the figure is the location of the project area. The Louisville & Nashville Rail Road line is depicted in the upper left-hand corner.....	25
Figure 7. Excerpt from the 1938 U.S. Geological Survey <i>Little Woods</i> quadrangle map (USGS 1938). Paris Road was in its original alignment, and the ICWW/MRGO had not yet been constructed. The current proposed project construction site is west of Paris Road in Section 44.....	30

CHAPTER 1 INTRODUCTION

This report details the cultural resources investigations pursuant to Delivery Order No. 0016, Contract DACW 29-94-D-0020 with the U.S. Army Corps of Engineers, New Orleans District. The Scope of Services required a cultural resources investigation on the north bank of the Gulf Intracoastal Waterway south of the intersection of Almonaster Avenue and Gentilly Road in Orleans Parish, Louisiana (Figure 1). The study area is a temporary area for the construction of components of the Mississippi River - Gulf Outlet (MRGO) new lock. These components will be floated from the construction site to their permanent location. The study area is bounded by Gentilly Road, Almonaster Avenue, Grant Avenue, the Gulf Intracoastal Waterway, and Paris Road, and is included Section 44 of T12 S, R12 E and Section 42 in T12 S, R13 E.

The Scope of Services specified that background research be conducted for the study area. This background search included a review of literature, maps, and records on file at the Division of Archaeology to develop a comprehensive understanding of the area. No field investigations were undertaken for this project.

The geomorphology of the study area, including geoarcheological considerations, is presented in Chapter 2 of this report. Chapter 3 reviews the environmental setting of the study area, including climate, floral and faunal communities. Chapter 4 briefly reviews aboriginal occupations in southeastern Louisiana. An historic overview of the project area is presented in Chapter 5. Previous archeological investigations conducted in the surrounding area of Orleans Parish are discussed in Chapter 6. Chapter 7 reviews aerial photographs of the project area for archeological potential. Chapter 8 presents a summary of findings and recommendations.

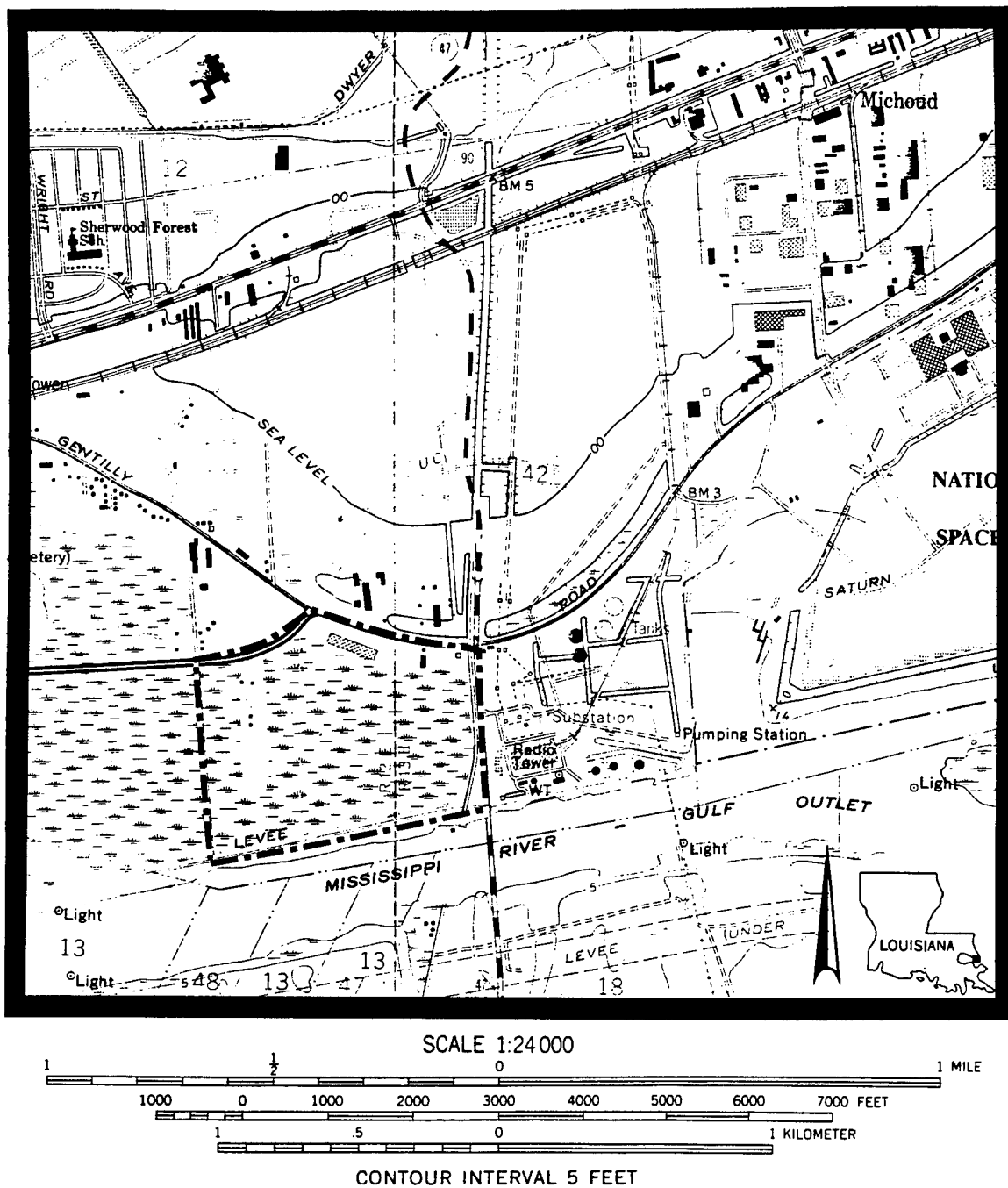


Figure 1. Excerpt from the Little Woods (1967, Revised 1994), LA 7.5' quadrangle showing the study area.

CHAPTER 2

GENERAL GEOLOGICAL AND GEOMORPHOLOGICAL SETTING AS RELATED TO CULTURAL RESOURCES

Geographic and Physiographic Setting

The project site is located in the City of New Orleans between Gentilly Road to the northeast, Almonaster Avenue to the northwest, the Intracoastal Waterway on the south, and Paris Road (La. Hwy. 47) to the east. It is a rectangular-shaped tract of land of approximately 185 acres (0.75 sq km) in extent.

The site is situated in the deltaic plain of the Mississippi River about midway between Lake Pontchartrain on the north and the present course of the Mississippi River on the south. In a natural state, the northern part of the site was a low, forested natural levee ridge flanking an abandoned distributary of the Mississippi River, while the southern part was a near-sea level, intratidal, fresh- to slightly brackish-water marsh and cypress swamp. However, within the last century, the site has been impacted by urbanization, drainage, road construction, and haphazard dumping and placement of artificial fill. Originally, the relief and elevation of the site were less than 2 ft (0.6 m). No streams cross the tract, and surface drainage was to the south and east by way of sheet runoff into Lake Borgne via Bayou Bienvenue.

In a regional geomorphological context, the site is mostly in an interdistributary lowland bounded by the natural levee ridge of the Bayou Sauvage distributary (locally known as Gentilly Ridge) to the north and the natural levee along the east bank of the Mississippi River to the south. Both natural levees initially developed when the Mississippi River constructed the St. Bernard delta complex, one of six that constitute the deltaic plain and that were formed within just the last 9,000 yrs.

Purpose and Scope of the Chapter

This chapter was prepared to describe the geologic setting of the site, discuss the geomorphic processes that have affected the area, and reconstruct the recent geologic history of the area. Emphasis was on identifying those processes and landforms that were influential in determining when and where Native Americans may have lived in prehistoric times and if artifacts or evidence of their presence may be preserved at the surface or buried in the sedimentary sequence.

No field work or reconnaissance of the site was conducted as part of this investigation. This was not necessary in order to describe the general geomorphological and geological context of the site since the writer is intimately familiar with the region, both in terms of its geomorphology and archeology. His dissertation was on the geomorphology and geologic history of this portion of the deltaic plain (Saucier 1963); he has undertaken detailed surface and subsurface investigations for engineering purposes (Eustis Engineering Company 1984); he has published reports on the engineering geology of the New Orleans area (Kolb and Saucier 1982; Saucier and Snowden 1995); he has investigated archeological sites close to the project area (Gagliano and Saucier 1963); and he has developed the most current chronological model for the region (Saucier 1994).

In the various investigations cited above and for other purposes, the writer has examined the logs of tens of thousands of borings in the New Orleans area, dozens of which were made within a few kilometers of the project area. Hence, he is quite familiar with the subsurface conditions. Moreover, there are several other detailed reports on the engineering geology of the region by the U.S. Army Corps of Engineers (e.g. Kolb and Van Lopik 1958; Kolb, Smith and Silva 1975) that the writer is intimately familiar with.

Geologic Framework and Controls

Southeastern Louisiana overlies the Gulf Coast Geosyncline, a broad structural zone of progressive downwarping of the earth's crust in which thousands of meters of unconsolidated sediments have accumulated over hundreds of millions of years (Murray 1961). All deposits within 1,000 ft (305 m) of the surface in the site area are of Quaternary age: those below an average depth of about 60 ft (18 m) are of Late Pleistocene age while those shallower than that are of Holocene age. Although the sediments were deposited in a variety of environments ranging from fluvial to marine, all are composed of clays, silts, and sands and gravels.

Regional geologic controls are dominantly subsidence and sea level variations. These processes have affected all parts of the deltaic plain and are responsible for the character of the sedimentary sequence which strongly reflects alternating periods of erosion and deposition under the influence of eustatically driven shoreline transgressions and regressions (Kolb and Van Lopik 1958). For the last several thousand years, subsidence and sea level rise have continuously displaced downward all landforms and deposits at an average rate of about .39 ft/century (12 mm/century) (Saucier 1963). Prior to that time, rates were significantly higher because of post-glacial rising sea level, and in those urbanized portions of the city where wetland drainage has taken place, the rates during the past century have been dramatically greater.

The vast majority of the Quaternary sediments of the greater New Orleans area have been derived directly or indirectly from the Mississippi River, being deposited directly as alluvium or after being reworked by coastal and marine processes. However, under the influence of subsidence and reflecting heavy vegetative growth under the warm, humid climate, organic sedimentation has been an important factor during the Holocene and is an integral part of a characteristic cycle of delta complex growth and decay.

Regional Stratigraphy and Geomorphic Processes

Formations and deposits referred to in this section are well illustrated by the perspective block diagram and cross sections contained in Figure 2. As has been the tradition in deltaic plain geology, Holocene deposits are classified according to the environments in which the materials were deposited. Each environment has a definable and predictive range of soil types, distinctive sedimentary characteristics, and engineering properties. Due to post-depositional weathering, depositional environments of the Pleistocene-age unit are usually unidentifiable and they are described in terms of formations.

The lowest and oldest unit of concern herein in the upper part of the sedimentary sequence underlying the New Orleans area is identified as the **Prairie complex** of Late Pleistocene age. It consists of at least 100 ft (30 m) of medium to stiff, gray, tan and yellow clays and silty clays of fluvial or nearshore marine origin (Kolb, Smith and Silva 1975). In the upper 25 ft (7.6 m) of the unit, the clays exhibit characteristics indicative of strong weathering and desiccation in a subaerial environment. The deposits immediately underlie an irregular erosional surface or geosol that formed as the result of the shallow entrenchment of regional drainage during the last major glacial stage (the Late Wisconsin glaciation) when the surface was an undulating upland coastal plain (Figure 2). A second erosional surface lies deeper in the formation and is believed to have been formed in a similar manner during the preceding Early Wisconsin glaciation.

The shallowest erosional surface is regionally extensive throughout southeastern Louisiana, and beneath the greater New Orleans area, it lies at a depth ranging between about 20 ft (6 m) and 120 ft (36 m) below sea level (Figure 3). From an engineering point of view and

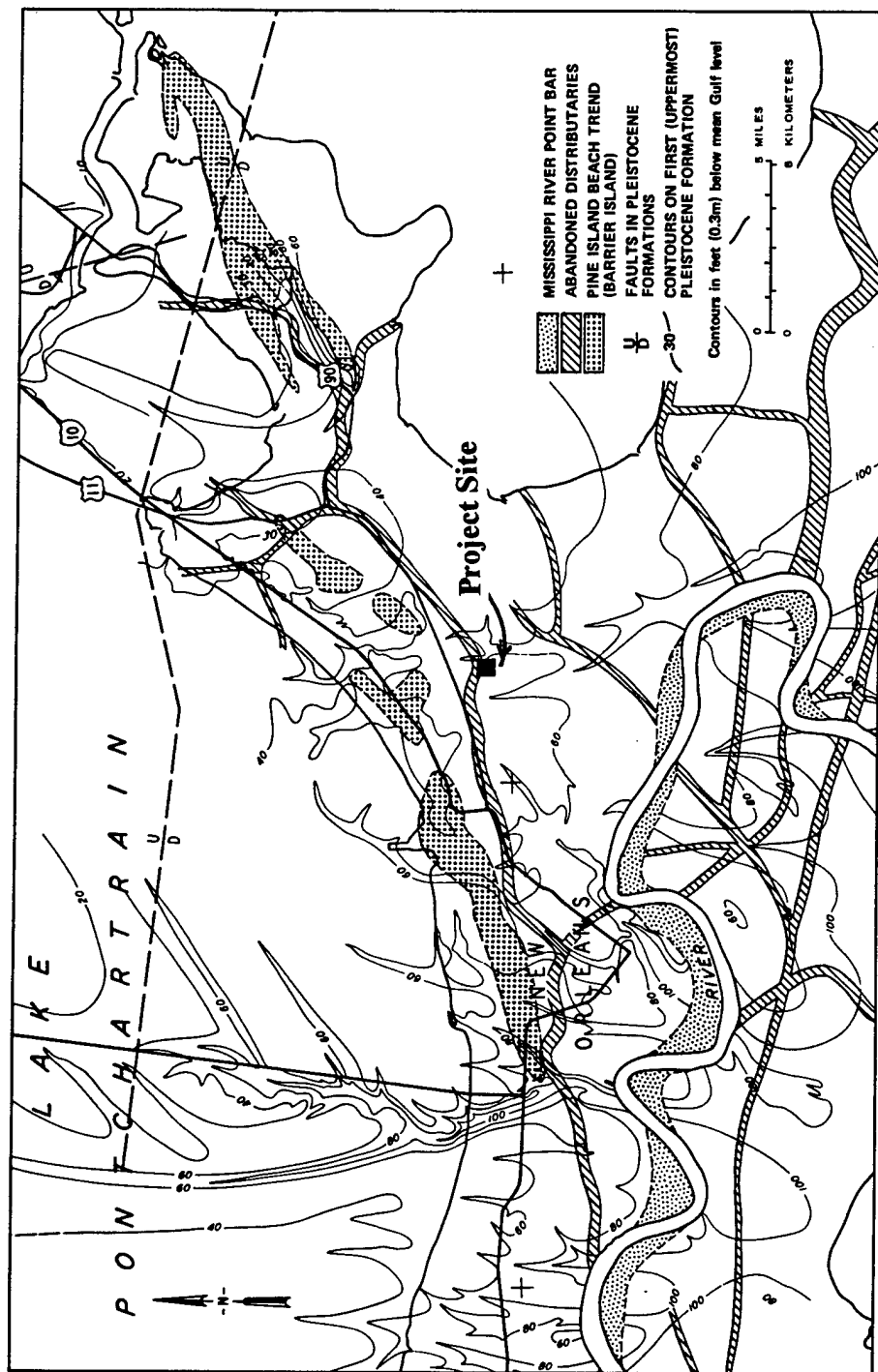


Figure 3. Major elements in the subsurface geology of the New Orleans area. From Kolb, Smith, and Silva (1975).

because of their physical properties, the deposits underlying the erosional unconformity are considered the local equivalent of "bedrock." During the last glaciation, the Prairie complex surface was exposed to several thousand years of weathering and entrenchment when sea level was as much as 400 ft (122 m) below its present level.

Moving up in the sedimentary sequence, the eroded surface of the Prairie complex is disconformably overlain by a thin and discontinuous layer of **nearshore Gulf** deposits of Holocene age (Figure 2). This layer represents materials laid down in a coastal to shallow marine environment as the post-glacial rising sea level transgressed across and submerged the eroded Pleistocene surface. The deposits vary in thickness from 0 to about 50 ft (15 m) and consist of gray or tan fine sands or clayey sands with abundant shell fragments and clay and silt lenses. Locally, the nearshore Gulf deposits bury thin layers of peat or organic clays that represent drowned forests or marshy areas on the Prairie complex surface.

As sea level continued to rise to within a few feet of its present level and open Gulf waters deepened, a large offshore beach ridge complex or **barrier island trend** formed from the northeastern corner of the Pontchartrain Basin and extended southwestward through the New Orleans area over a distance of about 35 mi (56 km). Because of its foundation engineering importance, this trend has been intensively studied and mapped (Eustis Engineering Company 1984; Saucier 1963, 1994) and is known as the Pine Island Beach Trend (Figures 2 and 3). It is composed of massive to cross-bedded, gray and tan fine to medium sands with a prolific marine faunal assemblage. This unit, dating back to 5,500 to 5,000 yrs ago, is the oldest (and deepest) unit of possible archeological significance. Although it is now almost completely subsided beneath sea level and surrounded and buried by later deltaic deposits, it was once a prominent, exposed coastal feature well above sea level and subsequently for many centuries formed "islands" of high ground surrounded by wetland environments.

Stratigraphically above the nearshore Gulf deposits and the barrier island trend is a layer of **prodelta** clays varying in thickness from about 10 to 30 ft (3 to 9 m). These deposits consist of relatively uniform, very soft to soft, gray clays with only occasional lenses of silt. They represent the first Mississippi River alluvium to be introduced into the New Orleans area--fine-grained deposits that were laid down in shallow Gulf waters ahead of an advancing delta lobe. Fragments of wood and organic debris are sometimes present, but evidences of marine life such as shells or shell fragments are not usually found. The prodelta clays resulted from seasonal pulses of turbid flood water that surrounded the beach trend and left behind a thickening blanket of soft sediments in shallowing water.

As the initial Holocene Mississippi River delta lobe prograded eastward, the deposits became emergent as deltaic distributaries extended themselves into the New Orleans area. Narrow, linear natural levee ridges developed along the advancing distributaries at the same time that broad expanses of interdistributary intratidal wetlands formed in the shallow basins between them. Within a relatively short period of time, the shallow open Gulf waters were transformed into a landscape characterized by a few forested ridges in the midst of broad tracts of cypress swamp and fresh- to brackish-water marshes.

Well developed **natural levees** along a typical deltaic distributary like Bayou Sauvage attained maximum heights of 5 to 10 ft (1.5 to 3.0 m) and total widths of about 1 mi (1.6 km). Natural levee deposits, lens shaped in cross section with the greatest thickness adjacent to the distributary channels, consist of moderate to well oxidized, firm to stiff, gray and brown clays and silty clays. In the deltaic plain area, they are second only in strength to the Pleistocene deposits, and historically have provided the only areas suitable for agriculture, urbanization, and transportation (before drainage, reclamation, and filling of wetlands). In prehistoric times, natural levees and a few beach ridges provided the only firm habitable ground and areas relatively immune to river and coastal flooding in the New Orleans area.

Interdistributary wetlands become widespread in an advancing delta lobe, expanding laterally and growing vertically to keep pace with subsidence through the addition of fine inorganic sediments. The deposits, consisting of very soft, watery, gray to black clays and organic clay, actually accumulated in intratidal marsh, swamp, or shallow ponds and lakes close to sea level. Once a delta lobe is abandoned as the active site of river deposition and begins to decay, the interdistributary wetlands continue to grow vertically but primarily through organic sedimentation. These deposits consist mostly of black or brown, fibrous or woody peats and highly organic clays. In the greater New Orleans area, the thickest deposits of peats and organic clays occur toward the centers of the interdistributary basins where they may exceed 16 ft (4.9 m) (Gould and Morgan 1962).

As the delta lobe continues to deteriorate, several processes take place to change the wetland landscape. Subsidence promotes salt water intrusion and fresh-water marshes become brackish, cypress swamps die out and are replaced with marshes, and brackish-water marshes break up and erode with increasing areas of open water. Swamp or marsh deposits encroach upon the flanks of subsiding distributary natural levees, causing them to narrow.

As shown in Figure 2, three other depositional environments are present in the Holocene sequence of the New Orleans area. These include abandoned distributary channel fill deposits, point bar accretion associated with the meandering of the Mississippi River in its present meander belt, and small lake beach ridges. None of these environments are present in the project site vicinity and are not discussed further herein.

Site Stratigraphy

This writer is aware of 13 borings within the limits of the project site and many others in the vicinity that have allowed the contouring of subsurface horizons to much greater detail than is shown in Figure 3, for example (unpublished data in personal files). These data indicate that the top of the weathered Pleistocene Prairie complex surface is relatively flat, constituting an interfluvial surface between north-south trending entrenchments to the east and the west of the area. The depth to the horizon varies only from 56 ft (17 m) to 63 ft (19 m) below sea level. Above the top of the Prairie complex surface is a 20- to 30-ft-thick (6 to 9 m) zone of near-shore Gulf deposits consisting of a heterogeneous mixture of clays, silts, sands, and shells.

Next highest in the stratigraphic sequence in the region is the Pine Island Beach Trend. Extremely detailed mapping of the unit in the New Orleans area (Saucier 1994) indicates that, in the site vicinity, the ridge is in the form of a series of island-like masses of sand separated by tidal channels (Figure 4). Although the project site lies very close to what was the seaward margin of the ridge, it is not directly underlain by any beach deposits. An island area in which the deposits reach a thickness of at least 20 ft (9 m) lies as close as 600 ft (182 m) to the site across Paris Road to the east, however. In this island area that lies south of Bayou Sauvage, the beach ridge deposits are only about 10 ft (3 m) below the ground surface.

Below a depth of about 6 to 10 ft (1.8 to 3.0 m) and extending to the top of the near-shore Gulf deposits is a zone of prodelta clays that grades upward into interdistributary deposits. It is mostly a zone of very soft, fine-grained deposits reflecting the advance of the first Mississippi River sedimentation into the area.

Natural levee deposits along the south side of the Bayou Sauvage distributary characterize approximately the northern one-fourth to one-third of the project site. These extend from the surface to a depth of about 10 ft (3 m). Actually the levee deposits may extend laterally in the shallow subsurface to nearly the southern limit of the site; however, they are in the form of a southward-thinning and deepening wedge that is overlain by a correspondingly thickening

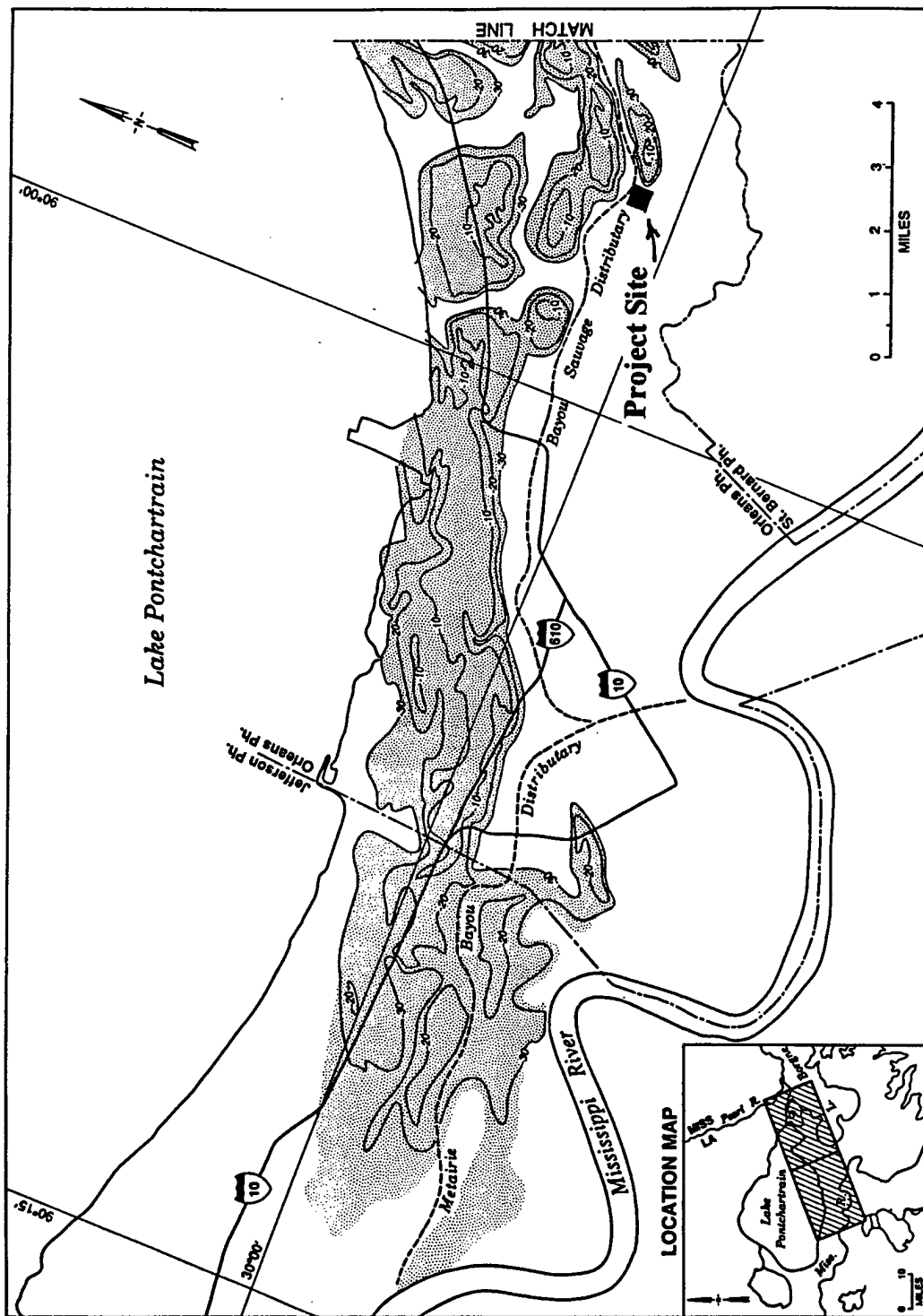


Figure 4. Configuration of the top of the Holocene-age Pine Island Beach Trend buried beneath deltaic deposits in the greater New Orleans area. From Saucier (1994).

veneer of interdistributary peats and organic clays. Along the banks of the Intracoastal Waterway, it is probable that the surficial organic deposits are about 10 ft (3 m) thick and extend downward and grade directly into prodelta deposits.

In early historic times, the interdistributary environment over most of the southern two-thirds of the site area south of the natural levee ridge was a swamp forest community composed mainly of baldcypress (*Taxodium distichum*) and tupelo gum (*Nyssa aquatica*). A small amount of fresh-water marsh may have occurred at the southwestern corner of the tract. Considering the geologic history of the site area, it is likely that all of the interdistributary deposits of the subsurface represent a swamp environment.

As will be discussed in more detail in the next section, the Bayou Sauvage delta lobe is actually the second and most recent of two delta lobes to affect the New Orleans area. An earlier lobe is believed to have extended distributaries into the region and was the sedimentation event that isolated the Pine Island Beach Trend from the marine environment and turned the area into a subaerial deltaic plain landscape (Saucier 1963, 1982, 1994). Some of the strongest evidence for this early delta lobe is a buried archeological site--the Linsley site (16OR40)--that was discovered approximately 2 km east of the project site along the Intracoastal Waterway (Gagliano and Saucier 1963). The site was interpreted as being located on a small buried distributary natural levee about 8 ft (2.4 m) below sea level. Unfortunately, despite numerous borings in the area, the buried natural levee has not been detected at other locations, and consequently its trend cannot be established with certainty. It is presumed that it flowed from west to east and had to have been located south of the Pine Island Beach Trend. Considering the configuration of the beach trend and its influence, the buried distributary probably lies just south of the project area and likely most of its natural levee has been destroyed by construction of the Intracoastal Waterway.

Geologic History

The following scenario has been constructed from the evidence in the stratigraphic record and from the basic knowledge of Lower Mississippi Valley geology to help the reader place the landforms and environments discussed above into context. The scenario is also intended to point out how and why certain units have archeological significance and others do not.

A discussion of the chronology and sequence of events that led to formation of the sedimentary sequence below the top of the second erosional surface (geosol) of the Prairie complex (Figure 2) is irrelevant to the purposes of this report. All of the deposits are at least 100,000 yrs old and are directly related to known glacial stages.

The first important event represented in the upper part of the sequence described earlier was the deposition about 30,000 yrs ago of a seaward-thickening wedge of sediments in a coastal setting during a brief episode of high sea level (the Middle Wisconsin Stage). In the New Orleans area, the wedge has a nominal thickness of about 100 ft (30 m) and constitutes the first (shallowest) unit of the Prairie complex (Figure 2). Shortly after its deposition, sea level fell with the waxing of the Late Wisconsin glaciation and the Gulf shoreline rapidly regressed southward, exposing the previously deposited coastal sediments to subaerial erosion and weathering. Local streams downcut into the deposits, creating narrow, sinuous, shallow entrenched valleys and contributed to the formation of a slightly hilly landscape.

Maximum entrenchment occurred coincident with the peak of the last continental glaciation about 18,000 yrs ago. Thereafter, as glaciation waned, sea level rose episodically with periods of very rapid rise alternating with brief stillstands, causing the Gulf shoreline to transgress swiftly across the coastal plain landscape. This episode is known as the Holocene

transgression. As sea level rose, relatively high areas of the landscape were planed off, low areas were filled in, forests were drowned, and the mouths of small entrenched streams became estuaries. Offshore, a thin layer of reworked sediment was laid down in a faunal-rich environment. About 7,000 yrs ago, the Gulf shoreline transgressed across the site area and by 6,000 yrs ago the shoreline stabilized briefly a short distance to the north. With an abundant supply of coarse sediment reworked from the eroded Prairie complex and still larger volumes transported into the area by longshore currents, the Pine Island Beach Trend began forming as an offshore barrier. By 5,000 yrs ago, it had accreted to the southwest and attained its maximum length, width, and height, and partially sheltered a large sound to the north in the Pontchartrain Basin area. However, the site area remained just offshore in shallow Gulf water in a rich marine environment.

The clear-water, saline conditions came to a rather abrupt end about 4,800 yrs ago when the Mississippi River shifted eastward from central Louisiana and started developing an early phase of the St. Bernard delta complex into the New Orleans area. Salinities declined, turbidity levels increased markedly, and water depths decreased as large amounts of clays were deposited ahead of advancing distributaries. As the delta front advanced to the western end of the beach trend, the Pontchartrain Basin was isolated as a brackish-water bay and channels were scoured through the ridge to accommodate tidal flow. Some distributaries advanced eastward north of the Pine Island Beach Trend while at least one developed to the south past the site area (Saucier 1963). This sedimentation event completely isolated the beach trend from the Gulf and caused an ancestral Lake Pontchartrain to form.

Active deltaic sedimentation in the New Orleans area probably lasted only a few hundred years. After that time, the locus of delta growth shifted still farther eastward and subsequently into central Louisiana to the west (Frazier 1967), leaving the site area in a marginal deltaic environment. Distributary natural levees subsided and the adjacent interdistributary wetlands deteriorated. Due to subsidence and a small amount of sea level rise, the distributaries probably were below sea level and no longer habitable by about 3,000 yrs ago.

About 2,800 yrs ago, the Mississippi River diverted flow back into the New Orleans area as it rapidly developed lobes of the late phase of the St. Bernard complex. However, the site area *per se* was probably not directly affected until relatively late in that phase when the Bayou Sauvage distributary formed. This small delta lobe formed as a result of a diversion near the center of the city and affected only the southeastern portion of the Pontchartrain Basin (Figure 3). It is believed to have begun forming about 1,800 yrs ago and was fully developed and in the process of deteriorating by about 1,200 yrs ago (Frazier 1967; Saucier 1963). Thus, development of the natural levee along the north side of the project site took place during this interval. Subsequently, there has been no Mississippi River discharge through the system and subsidence has been the prevailing process. It can be inferred, therefore, that most of the swamp deposits that have encroached onto the natural levee date to within the past 1,200 yrs.

The date of 1,200 yrs ago is also believed to have been the time when the Mississippi River developed its present course through the New Orleans area (Figure 3) and southward to the Gulf of Mexico. This event may have increased turbidity levels in the project site area during times of major flooding, but no discrete deposits have been identified. Natural levees along the present river channel were probably sufficiently well developed by about 800 yrs ago such that essentially those environmental conditions of the early historic period were prevailing. Thus, during the last 800 yrs, the site area has experienced essentially only organic sedimentation, and the majority of Mississippi River seasonal overflow that entered the basin was conveyed eastward by Bayou Bienvenue into Lake Borgne.

Geoarcheological Considerations

The Prairie complex surface underlying the site area is old enough to have been occupied by humans during the Early Archaic and Paleo-Indian periods when it would have been an undulating upland landscape. However, any evidence of their presence would have been destroyed by erosion during the Holocene transgression. Only along the flanks of some of the deeper entrenchments would there have been any chance that sites would have been buried by estuarine fill, but these conditions do not occur in the site area. Even if they had, any surviving cultural materials would be buried to a depth of over 60 ft (18 m).

Between about 7,000 and 4,800 yrs ago, a period of 2,200 yrs, the site area was mostly a shallow open water, nearshore environment. Mid way through that interval, the Pine Island Beach Trend formed and almost certainly would have been an attractive local for Middle Archaic-period settlement. No Archaic-period sites of any type have been found, however, and only a few Tchula-period sites are known from near the eastern end of the beach ridge. The presence of sites on the beach ridge is largely irrelevant, however, since no part of it lies beneath the project site.

A site of the Poverty Point period (Linsley site) is associated with the early phase St. Bernard complex distributary described above, but this also is irrelevant since no habitable landforms of this lobe are believed to be present in the site area. Similarly, no other distributary natural levees formed until the Bayou Sauvage lobe developed beginning about 1,800 yrs ago. That system is old enough to contain sites as old as the Marksville period, but to this writer's knowledge, none older than the Baytown period have been found, and these are located on small distributary branches well out toward the margin of the delta lobe (Saucier 1963). It appears that the more inland portion of the lobe (i.e., Bayou Sauvage *per se* or the Gentilly Ridge) was not as attractive as the distal lobe areas that were closer to aquatic habitats rich in fish and shellfish. Consequently, sites of the Marksville or later periods are not expected to occur. Considered in another way, if sites are (or had been) present, they would probably be conspicuous shell middens located at the surface along the crest of the natural levee ridge which would have been discovered during earlier cultural resources surveys of the area.

In late prehistoric and colonial times, Gentilly Ridge was the principal corridor of overland movement from New Orleans to points east of the city in Louisiana and along the Mississippi Gulf Coast. It is known to have had "Indian trails" and was the route of one of the first roads constructed outside the metropolitan area in the late 18th century. Consequently, sites of this vintage could be present along or close to Gentilly Road at the northern edge of the project site.

In summary, no cultural resources other than those a few hundred years old are likely to be present in the site area and these will be at the ground surface (if not buried or obliterated by artificial fill). No buried archeological sites should be present.

CHAPTER 3 NATURAL SETTING

Introduction

The Mississippi River delta region within which New Orleans is situated is characterized by a set of ecological parameters which are integrated into a dynamic ecosystem with enormous biological productivity. The prime integrating feature of this ecosystem is water. Primary units of the system are forests, fresh water marshes, brackish marshes, saline marshes and the offshore area (Bahr and Hebrard 1976:1-3; Bahr et al. 1983).

Climate

New Orleans is located within the subtropics, and its weather is strongly influenced by the nearby Gulf of Mexico. Rainfall exceeds 160 cm (64 in) annually. Periods of greatest rainfall generally occur in August and September. October is, on average, the driest month. The mean annual temperature is about 21° Centigrade (70° Fahrenheit), with a mean low in January averaging 11° Centigrade (52° Fahrenheit) and a mean high in July of about 29° Centigrade (84° Fahrenheit). The growing season exceeds 260 days (White et al. 1983:103).

Hurricanes and storm surges occur intermittently, and these have profound effects on floral, faunal, and human communities. Although these storms are natural calamities, they also produce beneficial effects. Large amounts of sediments and nutrients are deposited into coastal estuaries, resulting in both short- and long-term increases in primary productivity (Bahr et al. 1983:22).

Hurricanes and tropical storms are characterized by low barometric pressure. This causes a significant rise in sea level. In combination with winds up to 200 or more km/hr, storm surges as great as 7 m (23 ft) can drive ocean and lake water a considerable distance inland. The flooding problem is aggravated by accompanying tropical rains (Bahr et al. 1983:23).

Plant Communities

Prior to cultivation and urbanization of the New Orleans area, upland forests would have occupied most of the natural levee. Upland forest habitat would have graded to bottomland hardwood as elevation declined and flooding frequency thereby increased. Similar plant communities remain present on the Pleistocene terrace north of Lake Pontchartrain. Natural climax vegetation in such forests is dominated by mixed deciduous and evergreen trees that are less tolerant of flooding than are bottomland hardwood species. Woody species in a natural levee forest would have included oaks (*Quercus virginiana*, *Q. alba*, *Q. nigra*), shagbark hickory (*Carya ovata*), hackberry (*Celtis laevigata*), sweetgum (*Liquidambar styraciflua*), pecan (*Carya illinoensis*), magnolia (*Magnolia* spp.), and various pines (Bahr et al. 1983:82).

As elevation declines at the edges of the natural levee, distinctively different plant communities occur. One of these is a "hardwood bottoms" community. The "cypress-tupelo" forests are located at slightly lower elevations. An intermediate swamp is sometimes located between these two communities. Large tracts of marsh occur in surrounding areas. Elevation of the land dramatically affects distribution and composition of plant communities within the area. Differences of only a few centimeters in elevation are associated with striking changes in vegetation. This is largely the result of the effects of soil saturation (White et al. 1983:102-103; Bahr et al. 1983:43-45).

Hardwood bottom forests in the area are dominated by the water oak (*Quercus nigra*). Subdominants include the sweet gum (*Liquidambar styraciflua*), hackberry (*Celtis laevigata*), and live oak (*Quercus virginiana*). Other forest species include the box-elder (*Acer negundo*), honey-locust (*Gleditsia triacanthos*), American elm (*Ulmus americana*), and the Nuttall oak (*Quercus nuttallii*). The most common shrub species are palmetto (*Sabal minor*) and green haw (*Crataegus viridis*), but thickets of possum-haw (*Ilex decidua*) also occur. Within forest gaps, elderberry (*Sambucus canadensis*) and French-mulberry (*Callicarpa americana*) occur. Introduced species such as the camphor tree (*Cinnamom camphora*) are also present (White et al. 1983:103-104).

Vines are found throughout the bottomland forest, and few trees are observed without them. The most common of these include poison-ivy (*Rhus toxicodendron* var. *vulgaris*), Virginia creeper (*Parthenocissus quinquefolia*), supple-jack (*Berchemia scandens*), pepper-vine (*Vitis rotundifolia*), muscadine (*Vitis rotundifolia*), and hemp-weed (*Mikania scandens*) (White et al. 1983:104). Herbaceous ground cover is generally absent.

The cypress-tupelo swamps, located at lower elevations, are dominated by bald cypress (*Taxodium distichum*). Water tupelo (*Nyssa aquatica*) is often either a sub- or co-dominant species. Red maple (*Acer rubrum* var. *drummondii*) and ash trees (*Nyssa aquatica*) represent the other sub-dominants in this community. Shrubs include wax-myrtle (*Myrica cerifera*) and button-bush (*Cephalanthus occidentalis*), while vines are cat-briar (*Smilax* spp.), trumpet-creeper (*Campsis radicans*), and poison ivy. Herbaceous ground cover, absent in the bottomland community, includes smart-weed (*Persicaria punctata*), alligator-weed (*Alternanthera philoxeroides*), swamp potato (*Sagittaria lancifolia*), and water hyacinth (*Eichhornia crassipes*) (White et al. 1983:105). Maps from the eighteenth and nineteenth century indicate that dense cypress forests stood between settled areas of the natural levee and Lake Pontchartrain.

Between the hardwood bottom forest and the swamp forests, an intermediate swamp forest sometimes occurs. It can be extensive due to the gradual slope of the land. Swamp red maple, American elms, and water oaks are common here. Palmettos create a dense understory, which is nearly impenetrable in some locations (White et al. 1983:105).

The other predominant plant community in the vicinity of New Orleans occurs in the marsh areas. Marshes are categorized according to their degree of salinity. The areas covered by the various marsh communities varied through the period of prehistoric occupation due to variation in fresh water influx compared to salt water intrusion.

The ecological distinction between a swamp and a marsh is the absence of trees in the latter. Marsh soils are peat and muck, and elevation of these is less than one meter above mean sea level in the vicinity of the study area. In the brackish or intermediate marsh, cord grass (*Spartina patens*) is dominant, while swamp-potato (*Sagittaria lancifolia*) predominates in freshwater marsh. Numerous other species co-occur with these (White et al. 1983:106-107).

Fish

Although the Mississippi River supports various species of freshwater fish, it is relatively unproductive because of high turbidities and strong currents. Freshwater sport species presently exploited in the vicinity of the project area include largemouth bass, spotted bass, yellow bass, black and white crappie, bluegill, spotted sunfish, and redear sunfish, as well as warmouth, channel, flathead, and blue catfish. Commercially exploited fish include catfish, bowfin, carp, gars, and buffaloes (U.S. Army Corps of Engineers 1984:16-17).

Waters in the estuaries in the vicinity of New Orleans host a diverse assemblage of species of fish. These species are highly mobile, and seasonal movements of fish populations are widespread. The result is that marine fish penetrate inland to fresh water habitats, while fresh water species are sometimes found in more saline environments. Also, the lower reaches of freshwater streams probably serve as nursery areas for the young of some marine species (Bahr and Hebrard 1976:69).

Birds

At least 216 species of birds are known to occur in estuary and swamp areas in the vicinity of New Orleans. Approximately 43% of these are passerines. Some species of this group are permanent residents, while others are only present seasonally. The remainder of the 216 species are predominantly waterfowl, many of which are migratory. Because New Orleans lies near the terminus of the Mississippi flyway, which is the largest waterfowl migratory route in North America, birds represent a potentially abundant source of food, feathers, and bone for tools (Bahr and Hebrard 1976:6-7, 78-115).

Mammals

Important fur-bearing species present in the vicinity of New Orleans include the muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), mink (*Mustella vison*), and otter (*Lutra canadensis*). Other mammals known to occur in the area include the Virginia opossum (*Didelphis virginiana*), the non-indigenous nine-banded armadillo (*Dasypus novemcinctus*), the swamp rabbit (*Sylvilagus aquaticus*), the fox squirrel (*Scirus niger*), the fox (*Vulpes fulva*), the bobcat (*Lynx rufus*), the beaver (*Castor canadensis*), the civet cat or spotted skunk (*Spilogale putoris*), and the white-tailed deer (*Odocoileus virginianus*). In addition, several species of terrestrial rodents and of bats are endemic (Bahr and Hebrard 1976:118-126). The mammalian faunal inventory would have been even more extensive during the prehistoric period (Speaker et al. 1986:26-29).

CHAPTER 4

ABORIGINAL OCCUPATIONS IN SOUTHEASTERN LOUISIANA

This chapter presents a brief overview of Native American culture history in southeastern Louisiana. As few sites dated to the Paleo-Indian or Archaic Periods have been reported in southeastern Louisiana (Gagliano 1963; Gagliano and Saucier 1963), this overview begins with the Poverty Point period. Although land formation was occurring in the vicinity during the Archaic period, evidence indicates that human occupation occurred subsequent to maximum development of the distributary network. Additionally, Paleo-Indian and Archaic period sites are likely to have been buried or destroyed by subsequent riverine processes.

The Poverty Point Period (1500 B.C. to 500 B.C.)

The earliest known site in Orleans Parish is dated to the Poverty Point Period. It is known as the Linsley site (16OR40) and is situated on a buried natural levee associated with an earlier course of the Mississippi River. Material dredged from the subsided *Rangia* midden was used to define the Bayou Jasmine-Garcia Phase of the Poverty Point Culture (Gagliano et al. 1975:44-47). A series of radiocarbon dates and baked clay balls are evidence that link the site with the Poverty Point period (Weinstein 1978:A/23-A/25; Thomas 1982:3).

The name "Poverty Point" is derived from the type site, an area of massive earthwork construction, in northeastern Louisiana. This site is believed to have been a cultural center with trade networks and influence extending throughout the Lower Mississippi Valley. Baked clay balls known as "Poverty Point objects" are one of the important traits that mark the period. Other traits include an elaborate lapidary and microlithic industry, use of steatite vessels, and the use of exotic stone (Thomas 1982:5).

The Tchula Period (500 B.C. to A.D. 0)

Tchula period occupations in the Lower Mississippi Valley are associated with the Tchefuncte culture. The period has been called "the early ceramic period" because, with the exception of fiber-tempered pottery, it was the interval during which initial pottery complexes appeared in the Lower Mississippi Valley. Sites are few and scattered, and there are no universal markers. However, within subareas such as South Louisiana, regional markers, primarily Tchefuncte type ceramics, have been identified (Phillips 1970:7, 8, 15, 76).

Peoples of the Tchefuncte culture were the first to engage extensively in the manufacture of ceramics. Fiber-tempered and some grog-tempered or temperless sherds have been recovered from earlier Poverty Point contexts. These may represent primarily trade goods from the earliest pottery-making cultures to the east. The basic Tchefuncte ware is temperless or grog-tempered, with accidental inclusions of small quantities of sand and vegetable fiber. Sand-tempered wares represent a minority constituent of Tchefuncte site assemblages (Shenkel 1984:47-48).

The Marksville Period (A.D. 0 to A.D. 300)

The Marksville period is associated with a Hopewellian culture and tradition manifested throughout the Lower Mississippi Valley (Phillips 1970:7, 17-18, 886). The Hopewell culture's two major centers of development were in Ohio and Illinois, and date to between 200 B.C. and A.D. 400. Diffusion of aspects of the culture may have resulted from the activity of traders who established a wide-ranging network, sometimes termed the "Hopewellian Interaction Sphere." In addition to diagnostic pottery types of the Marksville period, conical burial mounds were characteristic of the culture. Interments are generally associated with grave goods. Some of these were manufactured from exotic raw materials (Neuman 1984:142-168).

The Baytown Period (A.D. 300 to A.D. 700)

The Baytown period has been defined as the interval between the end of Hopewellian/Marksville culture and the emergence of Coles Creek culture. In the southern half of the Lower Mississippi Valley, there are no area-wide horizon or period markers (Phillips 1970:901). The Baytown period is often referred to as the "Troyville period" by Delta archaeologists. Because of the lack of diagnostic markers for the period in southeastern Louisiana, it is often assimilated with the subsequent Coles Creek period, and the two are together referred to and discussed as "Troyville/Coles Creek cultures" (e.g. Neuman 1984).

The Coles Creek Period (A.D. 700 to A.D. 1000)

The Coles Creek period is the interval that begins with the emergence of Coles Creek culture in the southern part of the Lower Mississippi Valley and ends with the establishment of "full-blown" Mississippian culture in the northern part of the Valley (Phillips 1970:18). Although it appears to represent a population zenith in the eastern delta province, many sites tentatively classified as Coles Creek may actually be from the Baytown period (Wiseman et al. 1981:3/5).

Coles Creek culture was characterized by small ceremonial centers with mounds. These were surrounded by villages of varying size. The culture developed in the area between the mouth of the Red River and the southern part of the Yazoo Basin. Its influence filtered into the delta region of southeastern Louisiana (Brown 1984:95). Mounds associated with the Coles Creek culture generally are larger and exhibit more construction stages than those associated with the earlier Marksville culture. A more significant difference is that Coles Creek mounds are pyramidal and flat-topped, and they were used as substructures for religious and/or civic buildings. In contrast, Marksville peoples generally built conical burial mounds (Neuman 1984:167).

The Mississippi Period (A.D. 1000 to A.D. 1700)

The beginning of the Mississippi period is marked by the emergence of Mississippian culture in the northern part of the Lower Mississippi Valley and Plaquemine culture in the southern part (Phillips 1970:18-19). The Plaquemine culture itself is sometimes considered to be the classic development of temple mound construction in the lower portion of the Lower Mississippi Valley. However, archaeological excavations suggest that it actually represents a late prehistoric development of the preceding Coles Creek culture. Multi-mound construction and artifact assemblages are evidence that link the two. Absence of European trade goods indicates that the Plaquemine culture reached its zenith prior to contact (Neuman 1984:258-259). Sites dated to the period of contact represent a Delta-Natchezan phase. Proportions of ceramic types change, some new styles and types appear, and European trade goods are often found in association with the aboriginal materials (Quimby 1957:118-119, 134-144).

Aboriginal Occupation during the Colonial Period

Identities and locations of Indian tribes in Louisiana cannot be determined for any period prior to about 1700. At about that time, literate French settlers and visitors began to record their observations regarding aboriginal occupants of the area. Even so, it remains difficult to sort pre- and post-contact culture traits. This is especially true for the lesser tribes living along the Mississippi River and other areas within southeastern Louisiana (Kniffen et al. 1987:45).

The protohistoric and early historic periods were traumatic for aboriginal society in southeastern Louisiana. The effects of disease and of the ever-increasing European population are reflected in the declining aboriginal population and in the migrations by remnants of various tribes. Internecine warfare typified relations between the various groups (Giardino 1984).

Documentary evidence indicates that different Native American groups resided in the vicinity of New Orleans at various times. A group of Ouma fled to the vicinity of the city following a 1706 attack on the tribe by the Tunica (Giardino 1984:248-249). Both the Ouacha and the Tchouacha were settled near enough to New Orleans to have had frequent contact with the European inhabitants. The Ouachas territory was located between the Mississippi River and Bayou Lafourche. As late as the early-nineteenth century, individuals who identified themselves as Ouacha were present in this vicinity (Pearson 1992). The Tchouachas were settled in the vicinity of English Turn in the early-eighteenth century. In 1758, a group of Tchouachas was living in the vicinity of New Orleans. They, as well as other remnant tribes moved throughout Orleans, Jefferson, and Plaquemines Parishes during at least the French Colonial period, frequently hunting for the Europeans (Giardino 1984:252).

The archaeological record confirms material interchange between the colonists and Native Americans. Aboriginal ceramics have been recovered from eighteenth-century contexts at sites in and near New Orleans including the Herman-Grima House site (16OR45) and the Chalmette Battlefield (16SB147) (Yakubik 1990). Investigations at the site of the 1730 military barracks (16OR136) on Toulouse Street in the Vieux Carré (Yakubik and Franks 1991), as well as at the site of Bienville's concession on the west bank of the Mississippi River (16OR125) (Franks and Yakubik 1989) suggest that the settlers relied heavily on the use of aboriginal ceramics in the earliest years of the colony. The presence of Native American ceramics in the collection from the Cabildo (16OR129) (Yakubik and Franks 1992b) indicates that aboriginal wares were utilized in New Orleans into the early-nineteenth century, suggesting that contacts with Native groups were also maintained until this date.

CHAPTER 5 HISTORICAL OVERVIEW

Introduction

The study area is located in what was naturally an area of swamp and frequently-flooded prairie, between the course of Bayou Sauvage (also called Bayou Gentilly) and Bayou Bienvenue. The Chef Menteur Pass lies approximately 1½ miles to the east. The topography of the study area consists of the natural levee of Bayou Sauvage to the north, and poorly-drained clayey soils south of Bayou Sauvage. The natural setting of the study area has been heavily altered by levee construction, draining, and canal construction. Levees and ditches were originally built for agricultural purposes, probably beginning early in the nineteenth century. Twentieth-century navigable waterway and highway construction have most dramatically altered the landscape in the vicinity of the study area.

Both of the general soil type regions in the vicinity of the study area were utilized for stock raising and commercial agriculture in the historic period. The study area is located at the convergence of two large eighteenth-century land grants, the tract of brothers Mathurin and Pierre Dreux and that of Antoine Gilbert de St. Maxent. Both of these grants were developed first as *vacheries* or stock farms and then as plantations. As noted previously, the boundaries of the study area are Gentilly Road (ca. 1763), Almonaster Avenue (ca. 1967) Grant Avenue (ca. 1967-1968), the Gulf Intracoastal Waterway (ca. 1942), and Paris Road (ca. 1924-1925).

The Colonial Period to 1803

Available evidence provides no indication that Native American resided in the vicinity of the study area in historic times (Pearson 1984:84). However, Bayou Sauvage provided a sheltered inland water route from the lakes and Chef Menteur Pass to Bayou St. John and Bayou Metairie. It is very likely that Native Americans made frequent use of this watercourse in traveling between the lakes and the Mississippi River. Several tribes resided in the Pontchartrain basin and nearby on the Mississippi River in the early historic period, notably the Houma, who moved to Bayou St. John in 1706. French settlement contributed to a highly complicated series of tribal migrations in the eighteenth century. The tendency of Native American migration in the region seems to have been mostly toward the west, and numerous tribes may have passed along Bayou Sauvage during their movements. However, the area southeast of Lake Pontchartrain may have seen diminishing visits by Indians as the eighteenth century progressed (Swanton 1952: 195-212 *passim*; Kniffen et al. 1987:78, 86; Goins and Caldwell 1995:19). Bayou Sauvage likely remained an important waterway long after the road paralleling the Bayou was constructed, along the Gentilly Ridge, during the eighteenth century.

French settlement began along Bayou Sauvage almost simultaneously with the founding of New Orleans. Mathurin and Pierre Dreux were brothers from the commune of Gentilly, in the department of the Seine, France. The Company of the West granted them an extensive tract on Bayou Sauvage in 1718. Well outside the original boundaries of New Orleans, the Dreux tract evidently encompassed the portion of the project area in T12S R12E, Section 44, and in T12S, R13E, Section 42. Their timber cutting, brick-making, and cattle-raising efforts prospered, and the brothers became known as the *Sieurs de Gentilly*. The area of their tract was referred to as Gentilly, and the road following the course of Bayou Sauvage on its right (south) bank came to be called the Gentilly Road. On the left (north) bank was a parallel road, *La Crête* (the Crest) Road, which ran some distance toward Chef Menteur along the natural levee (Chase 1979:47, 202). Within the vicinity of New Orleans, the roads on Gentilly Ridge were almost the only topographic features of sufficient elevation to allow overland travel

(Pearson 1984:36). The habitation of the Dreux brothers appears to have been centered near modern Wilson Chapel in T12S R12E, Section 44 (Pearson 1984:36, 39), slightly more than one mile from the study area, and approximately one mile east of the center of the residential area developed as Gentilly Woods in the twentieth century. The relatively large home shared by the Dreux brothers was "for a century the showplace of New Orleans to which strangers were conducted" (quoted in Coastal Environments 1981, S-6).

For decades, the Dreux brothers and their successors at Gentilly concentrated on cattle raising. In 1769, a group of Gentilly inhabitants composed of Dreux, Dreux *frs*, Dreux Gentilly, Fazende, S. Bernoudy, and another Bernoudy, petitioned the Superior Council to halt the cattle-rustling incursions of Jean-Baptiste Brazillier on their property. Dreux stated that Brazillier, coming across Bayou St. John, had reduced his cattle herd from 700-800 to fewer than 80 animals (Coastal Environments 1981:S-2).

It is not certain how the Chef Menteur locale was named, but the name was evidently first applied to the Chef Menteur Pass between Lake Borgne and Lake Pontchartrain. Through at least the early-nineteenth century, the whole region east of Gentilly to the Pass was sometimes referred to as Chef Menteur. *Chef menteur* means "chief liar" or "chief deceiver," and as a name could have been derived from either a common noun or proper noun. According to Jean Bossu, a Frenchman resident in Louisiana in the 1750s, "*Chef Menteur*" was a Choctaw epithet directed at Governor Kerlérec for breaking his promises to the tribe (Samuel 1959:ix). Gayarré (1885) contended that the area was named for a Choctaw chief who was exiled from his tribe for inveterate prevarication. This chief settled near *Pointe aux Herbes*, on the southern shore of Lake Pontchartrain, a short distance west of the entrance to Chef Menteur Pass from the lake (Gayarré 1885, I:351). John Churchill Chase argued that the pass is a tidal estuary, the current of which flows back and forth according to the tide, and was probably named as the "chief" or largest of several passes with a deceptive current (Samuel 1959:xi-xii). No habitation in or usage of the area east of Gentilly is documented until the 1760s.

In March 1763, a huge tract of land to the north and east of New Orleans was granted by Governor Kerlérec to Antoine Gilbert de St. Maxent, a prominent colonist. This tract measured approximately 50 square miles (over 30,000 acres), lying between Chef Menteur Pass and Gentilly. This huge grant had as its western boundary the western edge of T12S R13E, Section 37.

St. Maxent had arrived in Louisiana from Lorraine in the 1740s, and in 1749, he married a young Creole lady of affluent family. He subsequently received a monopoly of the fur trade in the French territory of Missouri and amassed a sizable fortune. St. Maxent supported Kerlérec in the Governor's feud with Royal Intendant Vincent de Rochemore, and as reward in 1763, his fur trade monopoly was renewed. He also received the large grant east of the city. St. Maxent continued to cultivate his political connections under the Spanish administration of Louisiana. He married one of his daughters to Governor Luis de Unzaga Y Amezaga, and another to Governor Bernardo de Gálvez. Among his other business dealings, St. Maxent formed a partnership with Pierre Laclède Ligest that resulted in the founding of St. Louis in 1764. Receiving several offices and appointments from the Spanish, St. Maxent was an important figure in the Louisiana colony, particularly in matters of trade and Indian policy (Watson 1968:8-12; Coleman 1968:23; Clark 1970:196, 225).

There were three terms to St. Maxent's grant. The Superior Council stipulated that he had to establish a plantation on the tract within a year, and that trees on the tract were reserved for building and repair of royal ships. In addition, Maxent had to extend the Gentilly road, so that it ran from the western edge of his tract to Chef Menteur Pass. This road eventually became known as Gentilly Road, Chef Menteur Road (prior to the completion of New U.S.

Highway 90 in 1929), and Old Spanish Trail. The historical route of St. Maxent's road is followed by modern Gentilly Road in the study area, which remains closely aligned with what remains of the relict channel of Bayou Sauvage.

Secondary sources are in contradiction as to who owned the eastern edge of the Dreux tract when the area between Chef Menteur Pass and Gentilly was granted in 1763. Samuel (1959) states that a [Guillaume?] DuFossat acquired at least that portion of the tract on the western edge of that granted to Maxent, and says that Maxent had to complete the road from DuFossat's boundary (Samuel 1959:1). Research by George Castile and Sally K. Reeves (Coastal Environments 1981) notes that St. Maxent increased his Gentilly holdings in 1765. St. Maxent acquired 18 arpents fronting on Bayou Sauvage by purchase from the Capuchins, but reference is not made to where on Bayou Sauvage this tract was located (Coastal Environments 1981:S-2). However, Pearson (1984) states that the Dreux family retained this area throughout the remainder of the colonial period (Pearson 1984:36).

St. Maxent established a *vacherie* on the Chef Menteur tract, and cattle ranching was the principal activity into the nineteenth century. Most likely, the expanses of natural prairie in the region north of Bayou Bienvenue and west of Chef Menteur Pass (Figure 5) were the favored cattle ranges, rather than the oak-covered Gentilly Ridge and the cypress swamps that flanked Bayou Gentilly. In 1792, Governor Carondelet proposed the construction of a redoubt at Chef Menteur Pass, at "the cow ranch of Gilbert Antoine de Saint-Maxent." There is no indication that the Spanish fortification was ever built (Casey 1983:112).

Between St. Maxent's death in 1794 and December 1796, Louis Bronier (or Bronies) DeClouet acquired the St. Maxent tract "at the place commonly called Chef Menteur." DeClouet, having other interests, did not retain the property long. On January 7, 1801, Barthelemy Lafon purchased the former Maxent grant for 3,000 *piastres* or 1-ounce silver pieces (Casey 1983:114; Pearson 1984:37; Samuel 1959:14). Lafon was a colorful figure who was at various times an architect, real estate appraiser, cartographer, publisher, major in the militia, theatrical impresario, military engineer, and privateer. Lafon evidently did not intend to manage the Chef Menteur tract himself; in 1803, he advertised for a caretaker (Samuel 1959:17-18).

The Antebellum Period: 1803-1861

The Dreux tract was inherited by Francois and Louis Laufroy Dreux, descendants of Mathurin or Pierre Dreux, by the early years of the American period. Francois and Louis Leufroy Dreux made the original U.S. claim to the Dreux tract, or "Vacherie" as it was known. At Louis Dreux's death, he apparently held the full interest in the plantation, which was inherited by his wife and daughter. Madame Dreux was remarried to Jean-Francois de Saintegeme (or St. Geme), who also purchased the daughter's interest in the tract. St. Geme moved with his family to France, and died in 1842. His wife and her four children then inherited the Vacherie plantation, which they sold at auction in 1850 to John McDonogh (Coastal Environments Inc. 1981:S-7).

The old Dreux tract became a sugar plantation in the early-nineteenth century. An 1815 map by Arsene Lacarriere de la Tour (Figure 6) shows the Gentilly Road, the Dreux tract, part of the Lafon tract, and a simplified depiction of "prairies" and "swamps" in the region. The plantation buildings of "G. Dreux" are shown adjacent to bayou Sauvage, on its north side, in the vicinity of modern Wilson Chapel. It is not known if the Crest Road extended this far east. The Latour map shows the Lafon plantation complex located adjacent to Bayou Sauvage and Gentilly Road, in the area north of the modern Michoud slip on the Intracoastal Waterway. The Lafon plantation is discussed in greater detail below.

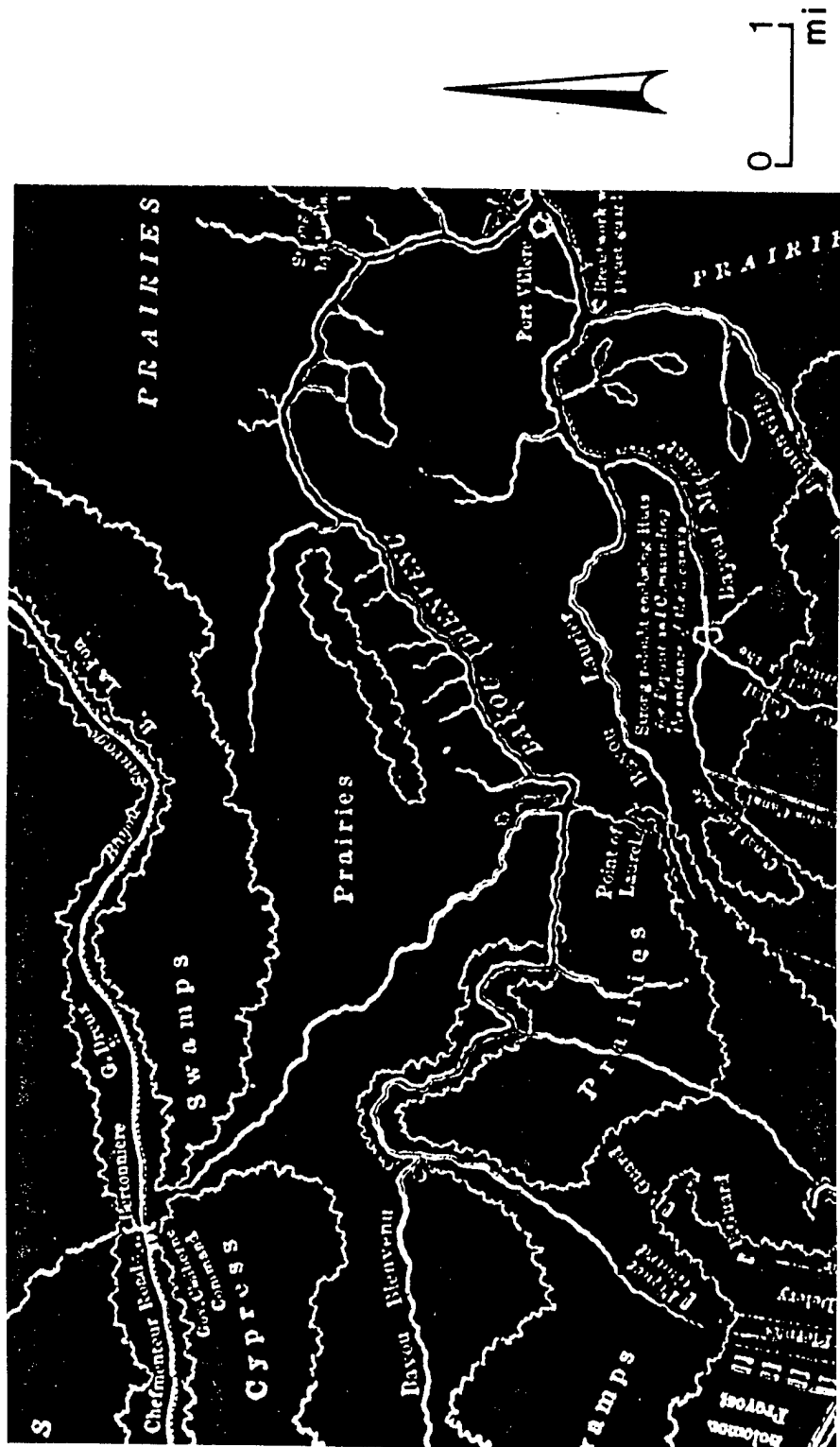


Figure 5. Excerpt from *Map Shewing [sic] The Landing Of The British Army by A. Latour* (Latour 1815). Bayou Sauvage, the "Chefmeuteur Road," and the plantations of G. Dreux and B. Lafon are indicated near the top of the figure.

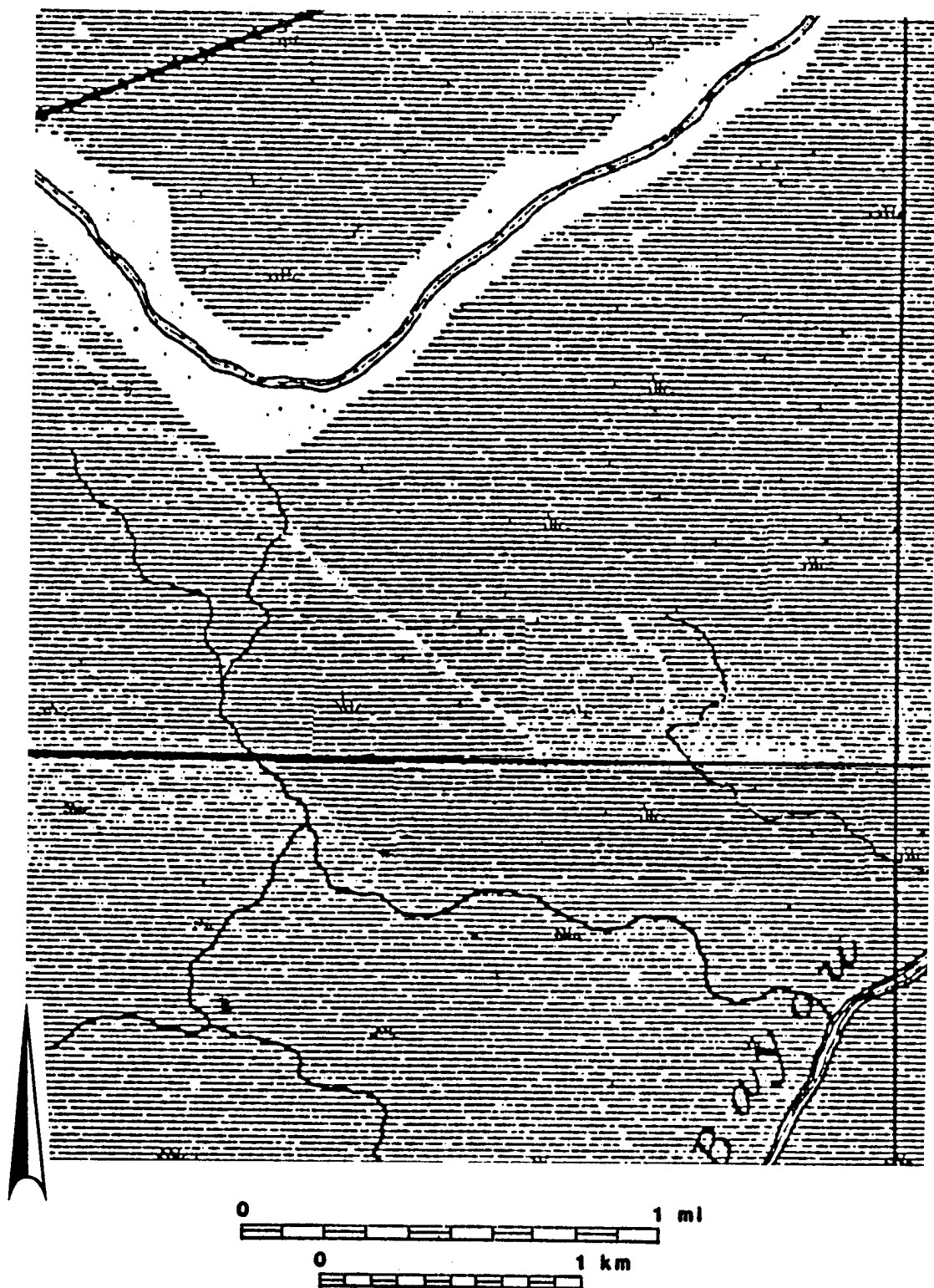


Figure 6. Excerpt from the 1892 U.S. Geological Survey *Chef Menteur* and *St. Bernard* sheets (From Pearson 1984:16). The bend in Bayou Sauvage in the upper portion of the figure is the location of the project area. The Louisville & Nashville Rail Road line is depicted in the upper left-hand corner.

It is possible that St. Geme leased the former Dreux plantation to Duvignac Dorville, who owned another property on Bayou Sauvage closer to New Orleans. In 1850, John McDonogh purchased the old Dreux tract from Dorville, who was acting as the New Orleans executor for the St. Geme estate. In the 1850 sale, the plantation was described as measuring 33 arpents facing each side of Bayou Sauvage, with buildings consisting of a main house, kitchen, hospital, store, stable, sugar house furnished with a mill and three sugar kettles; and also a dovecote, carts, plows, and assorted tools and implements. Included in the sale were 2 horses, 6 mules, 4 oxen, 6 wild oxen, 24 cows, 15 calves, 12 small bulls, 2 fine wild bulls, 20 adult slaves, and 7 slave children (Coastal Environments 1981:S-7). McDonogh died only three months after purchasing the Gentilly property. After the protracted legal affairs surrounding his will, the tract was subdivided into 214 one-arpent wide parcels and sold by his heirs in 1859. A number of purchasers acquired parcels south of Bayou Sauvage in the former Vacherie Plantation tract (Coastal Environments 1981:S-8,S-9; Pearson 1984:36).

Barthelemy Lafon continued to show remarkable activity in the early period of American administration of Louisiana. Lafon's claim to the Chef Menteur tract was confirmed by the U.S. Land Commissioners, and evidently included T12S R13E, Section 37. In 1805, Governor Claiborne was seeking to establish a postal route to Washington. Lafon suggested an option to Claiborne; an overland route along the "Chemin du Chef Menteur" or Gentilly Road to Chef Menteur, and then an extension of the road to the mouth of the Maringouin. The extension of Gentilly Road was to be built at Federal expense. The scheme came to naught, and a road east from Chef Menteur was not built until the twentieth century. In another plan, Lafon, in 1812, tried to engage Benjamin Latrobe as his agent to sell the trees from his Chef Menteur Plantation to the U.S. Navy (Samuel 1959:18, 19).

In 1809, Barthelemy Lafon drew a map of his property at Chef Menteur, showing a house built of cypress, three cabins, and a brickyard. The structures appear to have been located on the south bank of Bayou Sauvage, near the western edge of T12S R13E, Section 37. Lafon's large-scale surveying skills left something to be desired, and there is some difficulty of interpretation with regard to natural features in the vicinity of his plantation. When compared to the Latour map of the area drawn six years later, it seems likely that the plantation complex was situated north of the twentieth-century Michoud slip. It is therefore likely that the remains of the structures built during the ownership of Maxent and Lafon were destroyed by the construction of the Higgins-Michoud facility (see below) (Pearson 1984:37).

Lafon mortgaged his Chef Menteur tract to Jacques Francois Enoul Livaudais in 1811, and the following year was forced to sell it to Livaudais for \$15,000. Lafon may have re-acquired all or part of the tract before 1820 (Coastal Environments 1981:S-4).

The Chef Menteur and Gentilly Road area did not see any military action during the British invasion of Louisiana in 1814-1815. However, it seemed for a time as if Chef Menteur would be the route of the British assault on New Orleans. In December 1814, General Jackson ordered the Battalion of Free Men of Color and a small contingent of artillery, under Major Lacoste, to the confluence of Bayou Sauvage and Chef Menteur Pass. On December 25, Jackson had received the report that the British had landed at Chef Menteur and that Lacoste's troops had retreated to Lafon's plantation buildings, some three miles from the Pass. Troops stationed at the Gentilly Plantation became alarmed, since the prairies were unusually dry and firm and potentially allowed the British greater freedom of maneuver. Prairie fires were reportedly started by the British on Lafon's plantation. Major A.L. Latour was dispatched to the Lafon Plantation with Tennessee troops to reinforce Lacoste. Before Latour and the Tennesseans reached the Lafon plantation on the Gentilly Road, word arrived that the British landing at Chef Menteur was a false alarm. Troops were withdrawn from the Lafon plantation on January 6th, but after the battle of New Orleans, Jackson ordered 450 troops of the Battalion of Free Men of Color back to the Lafon plantation. These troops stayed at the

Lafon Plantation while the redoubt at Bayou Sauvage and Chef Menteur Pass was completed (Samuel 1959:20). The masonry Fort at Chef Menteur, later named Fort Wood and finally Fort Macomb, was begun in the period 1818-1822 (Casey 1983:112).

Barthelemy Lafon died about 1820. His will indicated that he called his Chef Menteur plantation "L'Heureuse Folie" or "Happy Folly." Evidently Lafon had re-acquired at least a portion of the Chef Menteur property prior to his death. Lafon had not married, and his brother, Jean Pierre Lafon, was named as his heir. Jean Pierre Lafon came from France to Louisiana following his brother's death, but himself died shortly after arrival. Portions of the Chef Menteur tract were sold to Barthelemy's creditors, and interest in the remainder of the tract was divided among Jean Pierre's heirs (Samuel 1959:22).

On October 3, 1827, Antoine Michoud (sometimes spelled Michaud, Micheaud, and other variants) purchased the portion of the Barthelemy Lafon tract that had been inherited by the heirs of Jean Pierre Lafon. Michoud had arrived in Louisiana from France in 1817. He made a sizable fortune as an "exchange and commercial broker" in New Orleans, and even served for 30 years as the Consul for the Kingdom of Sardinia and Savoy. Michoud grew sugar on his Chef Menteur tract, contributing to his great wealth. However, as time went on, Michoud established a reputation for miserliness and eccentricity. He ended up a dealer in second-hand hardware and what can only be described as junk. He also sold sugar and molasses from his own plantation, by the pound, over the counter in his shop in New Orleans. Remarkably, Michoud re-consolidated the former St. Maxent-Lafon tract. Michoud made about 12 purchases, and by 1852, had bought up all of the small parcels of land detached by Lafon's creditors and succession. An exception to his re-consolidation was the site of Fort Macomb, for which the Federal government paid him an indemnity (Samuel 1959:23-27; Coastal Environments 1981:S-4).

The Late Nineteenth Century: 1860-1900

Antoine Michoud evidently sold a right-of-way across his Chef Menteur Plantation to the New Orleans, Mobile, and Texas Rail Road in 1860 (Coastal Environments 1981:12), but it seems that this railway was not constructed. Antoine Michoud died in July 1862, leaving his plantation to Jean Baptiste Michoud, a nephew living in Lyons, France. The Michoud plantation was appraised at \$100,000 in Antoine's succession. Jean Baptiste Michoud remained in France, arranging with an attorney in New Orleans to handle his business affairs there. In 1873, Michoud sold a 100-foot wide right of way across the tract, and a lot in Section 37 for a station, to the New Orleans, Mobile, & Chattanooga Railroad Co. The station at Lee, located near the center of T12S R12E, Section 44, was also probably constructed in this period. In 1881, the N.O., M., and C. R.R. went bankrupt, and the Louisville and Nashville Rail Road purchased the line. In 1877, Jean Baptiste Michoud died and his son, Marie Alphonse Michoud, inherited the tract (Samuel 1959:28). In 1883, the New Orleans and North East Rail Road also purchased from Alphonse Michoud a right of way across the Michoud tract (Coastal Environments 1981:S-4), to the north of the study area.

An 1883 map shows the Michoud Plantation residential and industrial complex, consisting of the "chimneys of old sugarhouse," three cabins, and "former residence." These structures were likely on the site of the plantation buildings built during the ownership of St. Maxent and Lafon. As mentioned above, this site was probably obliterated by construction for the Higgins-NASA Michoud complex (Pearson 1984:37). Figure 6 shows the study area as depicted in the 1892 U.S. Geological Survey *Chef Menteur* and *St. Bernard* sheets (Pearson 1984:16).

The Twentieth Century

The twentieth century has seen dramatic landscape changes in the study area, brought about mostly in the period since World War II. However, from the 1910s, the eastern part of Orleans Parish has been viewed as an area of potential industrial and commercial development. In the years preceding U.S. involvement in World War I, large-scale proposals for building infrastructure in eastern Orleans Parish had been developed by the Port of New Orleans. The plan proposed a ship canal and basin to extend from the new Inner Harbor Navigation Canal as far as the modern Michoud complex, with a canal extending directly to Lake Borgne. The proposed ship channel and canal followed the same route as the later Intracoastal Waterway (discussed below). An extensive network of new Public Belt Railroad tracks was proposed for construction on both sides of the ship channel. This proposed rail network included the area developed several decades later as the Almonaster-Michoud Industrial District (Port of New Orleans 1915). These Public Belt rail lines would be connected with the "main road" of the Louisiana Southern "Frisco System." This Louisiana Southern line was present before 1914, running from south of Gentilly, intersecting with the L & N slightly east of Michoud Station, and then continuing to a bridge across Chef Menteur Pass at a point north of Bayou Sauvage (Fidelity Development and Investment Corporation 1914; Port of New Orleans 1915). The Louisiana Southern Rail line is no longer in existence in the project area.

In the early-twentieth century period of fiscal conservatism, the 1915 Port of New Orleans plan for eastern Orleans Parish did not come to fruition. It is interesting (if counter-historical) to speculate on the impact such development, so early, would have had on twentieth-century New Orleans economic history. The development of the plan at least demonstrates that grandiose speculative interest in the eastern Orleans Parish area is not a recent phenomenon.

In 1910, Marie Alphonse Michoud sold his Chef Menteur property to John Stuart Watson, representative of the New Orleans Drainage Company, for \$410,000. The tract was transferred by Watson to the New Orleans Drainage Company. The New Orleans Drainage Company intended to drain and develop the tract. Before work could begin, the New Orleans Drainage Company defaulted on a loan from the Continental and Commercial Trust and Savings Bank of Chicago. The property was ordered sold. Walter J. Engle, acting for the Continental and Commercial Trust and Savings Bank of Chicago, purchased the former Michoud tract. In June 1923, after much negotiation, R.E. Edgar de Montluzin purchased the Michoud tract. De Montluzin had previously developed Gentilly Terrace as a residential area (Samuel 1959:28-29).

In the early 1920s, Gentilly Road became part of the Old Spanish Trail. Promoters envisioned the Old Spanish Trail as an improved road running from California to Florida along historic routes. The Louisiana Highway Commission coursed Gentilly Road with gravel before 1923. Old Spanish Trail was considered a major auto road and received a dual designation as both U.S. Highway 90 and Louisiana State Highway 2. Chef Menteur Highway superseded Old Spanish Trail as U.S. Highway 90 at the end of the 1920s (see below). Gentilly Road was upgraded to a four-lane paved highway in the 1930s (Louisiana Highway Commission 1925a, 1925b; Coastal Environments 1981:18). Probably influenced by promotion of the Old Spanish Trail and later highways, R.E. Edgar De Montluzin envisioned a vast residential development for the Michoud Plantation tract, which he called the Faubourg de Montluzin. In the meantime, he sold timber from the tract and issued muskrat trapping leases. After Chef Menteur Highway was constructed by the Louisiana Highway Commission (see below), de Montluzin leased billboard space along this and other routes crossing the tract (Samuel 1959:30).

Among the important roads in the project area are Chef Menteur Highway and Paris Road. Within the project area, the roads are almost the same vintage. A portion of Paris Road is much older, having been created by Daniel Warburg ca. 1837 for the subdivision of the former de La Ronde Plantation ("Versailles") in St. Bernard Parish. However, Paris Road was not extended into modern Orleans Parish until the twentieth century. Previous to 1837, a canal with flanking canals purportedly extended from the frontage of the de La Ronde Plantation to Bayou Bienvenue (Wilson 1965:70-72). However, this canal may have been little more than a ditch. Relevant official plats dating to 1873 give no indication that the road had been extended as far as Bayou Bienvenue (Pearson 1984:14-19, 38). In 1914, the extension of Paris Road to Gentilly Road was still only proposed (Fidelity Development and Investment Corporation 1914). Other evidence indicates that this portion of Paris Road was built about 1924-1925 as Louisiana State Highway 61 (*The New Orleans Times Picayune* 1924; Louisiana Highway Commission 1925a, 1925b).

The construction of Chef Menteur Highway was begun about 1917 with Louisiana State Penitentiary labor, but was not completed until the end of the 1920s. Why it took a decade to build the gravel-coursed road is unclear, but lends credence to Huey Long's rhetoric about the underdevelopment of Louisiana roadways. The Chef Menteur swing-span bridge replaced the Chef Menteur Pass ferry in 1929, and was widely viewed as an exemplar of the Huey Long administration's highway achievements. The Chef Menteur Highway was paved with a hard surface beginning in 1930 (Louisiana State Highway Engineer 1918; Louisiana Highway Commission 1929). Figure 7 shows the project study area from the 1938 U.S.G.S. *Little Woods* quadrangle map.

De Montluzin entered over \$1 million in oil prospecting leases with major oil companies and independent prospectors on the Michoud tract. Not a single producing well was discovered during de Montluzin's proprietorship. In later years, various rights-of-way for power, telephone, and co-axial lines and cables were arranged by de Montluzin. Approximately 2,000 acres of the total Michoud tract were sold by de Montluzin during his 36-year ownership, about one half in small parcels (Samuel 1959:30-31). In 1932, de Montluzin sold a 1000-acre portion of his Michoud property to the East End Realty Co. (Coastal Environments 1981:S-5). This tract was located south of Gentilly Road, and encompassed Section 37 in T12S R13E.

Development did not occur in the East End Realty Company tract at Michoud until early in World War II. At the opening of 1942, the U.S. Maritime Commission selected the 1000-acre East End Realty Co. parcel for the location of a \$30 million shipyard. "Liberty Ship" cargo vessels were to be constructed at the yard. Higgins Industries of New Orleans, which became famous for the construction of amphibious landing craft and PT boats, received the contract to construct the Liberty ships. The U.S. Army Corps of Engineers dredged a connecting canal from the shipyard site to the existing terminal of the Intracoastal Waterway (Coastal Environments 1981:S-5).

Construction of the western Gulf portions of the modern Waterway route had begun soon after 1905. However, regular Federal funding of Intracoastal Waterway construction did not begin until the passage of the River and Harbor Acts of 1925. The strategic value of the ICWW was recognized at the outbreak of World War II, and in early 1942, Congress authorized an extension of the Waterway from the Louisiana Gulf coast to Florida. Beginning at this time, existing sections of the ICWW were enlarged and new portions constructed to a depth of 12' and a width of 125' (*The Times-Picayune* 1976). The Intracoastal Waterway channel from New Orleans to Mississippi Sound was dredged in 1942 through approximately 7½ miles of the de Montluzin property and the East End Realty Co. parcel.

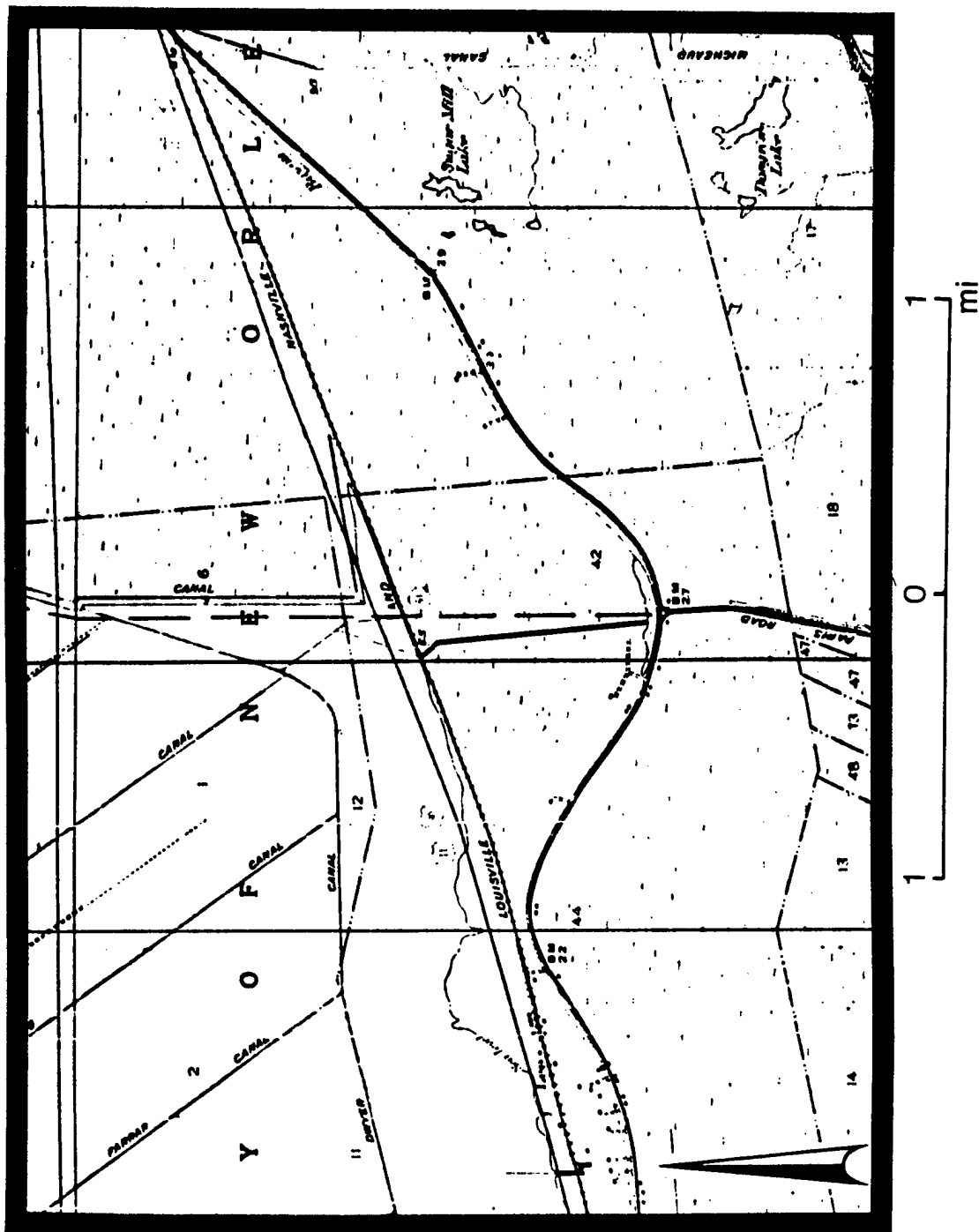


Figure 7. Excerpt from the 1938 U.S. Geological Survey Little Woods quadrangle map (USGS 1938). Paris Road was in its original alignment, and the ICWW/MRGO hand not yet been constructed. The current proposed project construction site is west of Paris Road in Section 44.

Construction of the shipyard was hurriedly begun. A large slip was constructed at the site of the planned shipyard, but prior to completion of the yard, the Maritime Commission decided to abandon the project. The U.S. government canceled the contract with Higgins in July 1942. Instead, in August 1942, the U.S. government decided to build a cargo airplane plant at the Michoud site. Higgins Industries again received the contract, this time for the construction of 1200 all-wood cargo planes. The aircraft plant had its own airport, and contained one building with 40 acres of air-conditioned work space. Some 300 small residential units were constructed for plant workers in the area adjacent to Gentilly Road, north of the Michoud slip. However, only two of the planes were completed by the cessation of hostilities, and the plant was ordered closed in November 1945 (Samuel 1959:30; Coastal Environments 1981:S-6).

The War Assets Administration took over the Michoud plant at the end of the war. A rental-purchase agreement for the site was subsequently negotiated with the Port of New Orleans. The Board was to acquire title to the property at the end of a 15-year rental period. With the beginning of the Korean conflict, the U.S. Army Ordinance Corps selected the Michoud plant for the manufacture of armored vehicle engines. The U.S. government wished to nullify the rental-purchase agreement with New Orleans, and was ultimately upheld in a decision of the District Court. In January 1951, the Chrysler Corporation received a \$30 million contract for the manufacture of engines for Patton and Sherman tanks at the Michoud facility. The plant opened in November 1951 and had a peak employment of about 2200 persons. The tank engine plant closed in July 1953. The U.S. Army maintained supervision of the idle facility until 1961. In that year, the National Aeronautics and Space Administration selected Martin Marietta Aerospace, Inc., and the Michoud facility to produce Saturn launch vehicle stages for the Apollo program. The Michoud plant has continued to produce large spacecraft components, including external fuel tanks for the Space Shuttle Program (Coastal Environments 1981:S-6; Lora 1983:66).

Alterations were made to the Intracoastal Waterway in the post-World War II era. The *Navigation Maps of Intracoastal Waterway* from 1956 indicate that the portion of the ICWW in eastern Orleans Parish was widened to 150' by that date. Between 1958 and 1960, the U.S. Army Corps of Engineers enlarged the portion of the Intracoastal Waterway between the Inner Harbor Navigation Canal and the location of the planned Mississippi River Gulf Outlet canal. The depth was increased to 36' and the width to 500'. After the Mississippi River Gulf Outlet was constructed in the period 1958-1962, the portion of the Intracoastal Waterway between the Inner Harbor Navigation Canal and the MRGO has often been referred to as the Mississippi River Gulf Outlet.

Enlargement of the Intracoastal Waterway and construction of the Mississippi River Gulf Outlet were partly related to the development the Almonaster-Michoud Industrial District (A-MID), created by the Louisiana state legislature in 1950. Consisting of a 7,000-acre area running from the Industrial Canal to east of the Michoud complex, A-MID was bounded on the north by Chef Menteur Highway and on the south by the Intracoastal Waterway (Petersen 1969:9).

Eastern Orleans Parish was touted for decades as the largest expanse of land in the country, available for development, that was also in proximity to a major urban center and well-served by water, rail, and road transportation routes. Railways had come in the nineteenth century and the Intracoastal Waterway was constructed during World War II. Interstate Highway 10, running from New Orleans to the Gulf Coast, was conceived in 1956. Residential, industrial, and commercial development were all limited in eastern New Orleans until the completion of the I-10. The last section within New Orleans, from Downman Road to Paris Road, was completed in 1971. The full extension of Paris Road to the Slidell Bridges had been completed in 1968 (Petersen 1969:9), and Almonaster Avenue was constructed

between 1967 and 1972. With these roadways in place, the outline of transportation networks in the project area was complete.

Aspects of infrastructure other than roads lagged in eastern New Orleans. A drainage system west of Paris Road and north of Chef Menteur Highway had been constructed before 1959, but the system south of Chef Menteur and east of Paris Road was not completed until 1967 (*Times-Picayune* 1967). The Grant Avenue Pumping Station was a part of this phase of drainage construction and came into operation in 1968. However, the 1960s system could not meet demands for drainage that developed in later decades. Old Gentilly Road frequently flooded into the mid-1980s (Heddon 1984:17; Katz 1988).

The administration of Ernest "Dutch" Morial Orleans gave a renewed impetus to development in A-MID after 1978, and sponsored significant infrastructure improvements in eastern New Orleans as a whole. The results of increased interest in A-MID by the city of New Orleans were ultimately disappointing. Perennial problems with drainage in the area produced the routine filling of development sites with construction and demolition debris. This practice, and the lack of a consistent police or enforcement presence in the area, encouraged promiscuous and illegal dumping of all sorts of refuse and waste throughout the A-MID area. The problem of illegal dumping, salvage yards visible from highways, and other environmental problems tarnished the image of A-MID and caused negative reactions among potential developers (Katz 1988; Heddon 1984).

The Master Plan for the Almonaster-Michoud Industrial District, developed over several years and published in 1981, was an optimistic document (City of New Orleans 1981). Several major infrastructure improvements were eventually achieved. The drainage system within the project area was upgraded in the second half of the 1980s, Almonaster Avenue was widened to four lanes, and planning was begun on the Interstate Highway 510 route along Paris Road (Katz 1982; Weinstein et al. 1980). Several large businesses moved into A-MID during this period. Among these firms was Boh Brothers Construction Co., who, in 1982, moved many of their operations to a 160-acre site on Almonaster Avenue.

Several proposed and expected features of the Master Plan did not develop. In the early 1970s, after completion of the I-10, the area near the intersection of Almonaster Avenue, Gentilly Road, and Paris Road had become the location of several trucking terminals. The Port of New Orleans planned a roll-on/roll-off truck and rail freight terminal on a 100-acre parcel bounded by Almonaster Avenue and Gentilly Road, Paris Road, the ICWW/MRGO, and Grant Avenue (City of New Orleans 1981). Drainage efforts were undertaken at the site before the proposed terminal was abandoned (Clay Miller, personal communication to Maygarden 1996). This site is the proposed construction site for the present project.

The portion of eastern New Orleans outside of A-MID was also an area of interest by developers after the post-World War II period. In 1959, R.E.E. de Montluzin sold the remainder of the "Faubourg de Montluzin" tract to New Orleans East, Inc., a partnership of Texas oil millionaire Clinton W. Murchison, Sr. and Toddie Lee Wynne, Sr. The price was reputedly \$30-\$40 million (Stuart 1981). A master plan of development was drawn up by New Orleans East, Inc., in 1959, but other developers began to build residential subdivisions in eastern Orleans Parish before them. In 1976, New Orleans East presented a massive development plan for "Orlandia," consisting of 28,000 acres of the former Michoud Plantation. The plan was altered and scaled back in implementation, but several large housing subdivisions and commercial developments were constructed. However, the real estate boom in New Orleans East, as the huge area became commonly known, fell flat due to a series of almost simultaneous events. The high crude oil prices driving the Louisiana and New Orleans economies deflated, federal funds for development in wetlands dried up, and state infrastructure funding dwindled because of budget deficits. By the end of 1984, New Orleans

East, Inc., was faltering because of slow home sales. Clint Murchison, Jr., filed for bankruptcy, and New Orleans East, Inc., went into receivership in early 1985 (Katz 1988, 1982; Toups 1986; Warner 1985; Heddon 1984; Stuart 1981; Massa 1976; Petersen 1969; *Times-Picayune* 1967).

CHAPTER 6 PREVIOUS INVESTIGATIONS

Gagliano et al. (1975)

A cultural resources survey was conducted by Coastal Environments, Inc. (CEI), along the Gulf Intracoastal Waterway (GIWW). The survey was performed for the U.S. Army Corps of Engineers, New Orleans District, to provide a better understanding of the cultural resources within the waterway.. CEI reported that over 600 prehistoric and historic sites were known to exist within the vicinity of the GIWW (Gagliano et al. 1975).

The GIWW traverses the Louisiana coastal area from Lake Borgne to the Sabine River. Included within the boundaries of this survey were Petit Anse, Bayou Grosse Tete, Carlin and Tigre Bayous (Gagliano et al. 1975:1). This area covered 315.1 miles along the GIWW. A total of 158 prehistoric and 42 historic sites were recorded. Seventy-eight prehistoric sites and 11 historic sites were found exposed along the banks of the GIWW and its surrounding bayous (Gagliano et al. 1975:vi).

The sites reported and observed by CEI which lie within the Locks survey area include the Linsley site (16OR40) and the Paris Road site (16OR41). These sites both contain prehistoric cultural resources which were located during dredging of the channel. CEI classified these sites as possibly significant. Recommendations for these sites included archeological monitoring before, during, and after any dredging or construction to the area.

Weinstein et al. (1980)

The Louisiana Department of Transportation and Development contracted Coastal Environments, Inc., to conduct field and laboratory investigations, literature and archival research, and site evaluation along the planned I-510 highway, which would extend from the Little Woods exit of I-10 to the Intracoastal Waterway (Weinstein et al. 1980). Field investigations included pedestrian survey and shovel testing at judgmentally selected locales.

Only areas clear of vegetation were surveyed. No new archeological sites were identified during this survey; however, several known sites within the vicinity were re-visited and recommended for possible monitoring. One of these was the Big Oak Island site (16OR6), which was originally located in the 1930s by Edward B. Doran. It is a large, crescent-shaped *Rangia* shell midden. The site was dated to 500 B.C.- A.D. 200, and is affiliated with the Tchefuncte culture and the Marksville period. Big Oak Island was placed on the National Register of Historic Places.

The Dwyer Canal site (16OR11) was originally located in the 1930s by Ford and Czajkowski. The site was a horseshoe-shaped dredged shell midden. Ceramic typology placed 16OR11 in the Pontchartrain phase of the Tchula period (Weinstein et al. 1980).

The Hayne Boulevard site (16OR15), originally located in 1957 by Saucier and Gagliano, consisted of an exposed shell midden. Artifacts from the original discovery of the site were not available; however, CEI did collect some ceramics, which associate 16OR15 with the Bayou Cutler phase of the early Coles Creek period (Weinstein et al. 1980:4-9).

The Little Woods site (16OR28), located by Saucier and Gagliano in 1957, consisted of an eroded shell midden. Again, the previous investigations at this site did not offer any material indicating representative cultures at 16OR28. CEI collected some badly eroded ceramics, which suggest possible components dating to the Coles Creek through Mississippi periods (Weinstein et al. 1980:4-11).

The Linsley site (16OR40) was discovered during the dredging of the Mississippi River Gulf Outlet (MRGO). The exact location of the site was unknown because of the impact of the dredging. Radiocarbon samples dated the site to 2490 - 1590 B.C., suggesting an early Poverty Point period occupation. The site was later assigned to the Bayou Jasmine phase of this period (Weinstein et al. 1980:4-11). CEI collected some artifacts, including small fragments of Poverty Point objects and mammal and fish bone fragments.

The Paris Road site (16OR41) was originally located in the 1960s during dredging. It consisted of a *Rangia* shell mound probably situated upon a natural levee of a distributary of Bayou Sauvage. Ceramics from previous investigations at the site suggested a component dating to the Pontchartrain phase of the Tchula period. CEI was unable to relocate the Paris Road site during this survey.

Coastal Environments, Inc. (1981)

During October and November of 1980, Coastal Environments, Inc., conducted a phase I cultural resources survey for The Economic Development Administration and The City of New Orleans for the Almonaster-Michoud Industrial District (A-MID) in Orleans Parish. Previous archeological reports and historic maps were consulted to determine areas with a high probability of yielding cultural resources. The area was divided into two zones. The natural levee of the relict Bayou Sauvage channel was chosen as the zone most likely to contain cultural resources. The swamp surrounding the project area was designated as a low probability area for containing cultural resources (Coastal Environments, Inc. 1981).

Survey methodology included vehicular and pedestrian survey. Shovel testing was conducted; however, CEI does not mention how many transects or shovel tests were actually excavated. Two out of six locales produced cultural remains: the Michoud Plantation site (16OR65) and the L & N Railroad roundhouse remnant (Coastal Environments, Inc. 1981). Standing remains were recorded at the Michoud Plantation site. Two brick chimneys and a possible wood-lined privy were observed in association with the Michoud site. Artifacts recovered from this area date to the middle- to late-nineteenth century. Extensive construction and landfill activities had disturbed both localities, and neither was recommended as eligible for the National Register of Historic Places.

Wiseman et al. (1981)

Coastal Environments, Inc., conducted a cultural resources survey of the Mississippi River - Gulf Outlet (MRGO) for the US Army Corps of Engineers, New Orleans District. The project area included the MRGO channel, spoil channel retaining levees, and the spoil canal (Wiseman et al. 1981). Prehistoric and historic cultural resources within the project area would possibly be threatened by maintenance dredging and levee building proposed by the Corps. These impacts associated with construction would include ship and boat traffic and the use of heavy equipment in the project area.

CEI attempted to develop a plan which would aid the Corps in ongoing management of the MRGO. To provide necessary information to make determinations, previously unrecorded cultural resources within the area were located and known sites were revisited. Examination of approximately 100% of the MRGO, all intersecting canals, and the spoil canal was accomplished by boat survey. During survey, four new sites and five spot finds were recorded.

Within the vicinity of the current project area, there were four previously recorded sites. These were the Linsley site (16OR40), the Paris Road site (16OR41), the Bayou La Loutre-MRGO site (16SB69), and the Mulatto Bayou site (16SB12). CEI recommended fur-

ther testing at Mulatto Bayou, Linsley, and Paris Road. Sixteen other previously recorded sites were located within 1.6 km of the current project area.

Thomas (1982)

During 1982, New World Research, Inc., investigated the Linsley Site (16OR40) for the Department of Planning and Port Development, New Orleans. The site was first reported in the 1960s by Gagliano and Saucier (Thomas 1982:3) and was assigned to the Poverty Point culture period. Subsequent research led to the conclusion that the Linsley Site should be considered significant.

New World Research, Inc., reported that at least three dredging episodes had been undertaken prior to and including the initial recording of the Linsley Site. Cultural resources survey was conducted in an attempt to relocate the site and to determine the site boundaries, integrity, and potential for further research (Thomas 1982).

Due to the depth of the site and overlying clay, it was necessary to rely on augering with 2 1/2- and 4-inch diameter bits for effective test results. During the investigation a Livingstone corer, a bucket auger, an hand driven bailer, and a mounted Giddings probe were used to recover cultural material. A total of 37 subsurface tests were placed in the project area. Twenty-four of these bore holes were in the vicinity of the Linsley site. Four of these produced cultural material, which, in the opinion of New World Research, Inc., was redeposited (Thomas 1982). *In situ* cultural material was not recovered. New World Research, Inc., concluded that the Linsley Site was destroyed during the dredging which occurred in the channel.

Pearson (1984)

Coastal Environments, Inc., conducted archeological investigations of the Paris Road site (16OR41) for the US Army Corps of Engineers, New Orleans District. Planned levee enlargement threatened to adversely impact the site, which was reported to be located within the project right-of-way. CEI attempted to re-locate the site and provide determinations of site size, content, and National Register eligibility.

The Paris Road site was originally located in the 1960s during dredging. It consisted of a *Rangia* shell mound probably situated upon a natural levee of a distributary off the Bayou Sauvage. Ceramics from the previous investigations at the site suggested a component dating to the Pontchartrain phase of the Tchula period. The reported site location was situated in the western portion of the proposed levee enlargement project area (Pearson 1984).

A total of 19 auger tests were excavated within the western boundaries of the project area. None of the auger tests yielded any prehistoric cultural material, and CEI was not able to re-locate the Paris Road site. The site may have been completely destroyed during dredging which occurred in the 1960s (Pearson 1984).

CHAPTER 7 REVIEW OF AERIAL PHOTOGRAPHS

As part of the background research for the cultural resources investigations, aerial photographs of the project area were examined to determine the potential for archeological sites. In areas such as southeastern Louisiana, where topographic relief is minimal, slight differences in elevation can be a determining factor in human settlement patterns. Different landforms, particularly differences in elevation, are clearly marked by distinct vegetation. Aerial photographs of a region illustrate these differences in vegetation as well as show relict drainage scars.

The earliest photograph of the project area was taken prior to 1958. Gentilly and Paris Roads are the northern and eastern boundaries of the project area. The southern boundary is the levee on the north side of the Intracoastal Waterway. Almonaster Avenue was not constructed. Three small buildings, likely houses, are located in the project area. All these buildings lie just south of Gentilly Road. The tracts adjacent to the buildings are cleared yards. As the photograph is not dated, there is no indication of the age or historic significance of these buildings. However, Gentilly Road was constructed ca. 1760s, suggesting there is potential for historical sites in the project area.

Gentilly Road follows Gentilly Ridge, the most prominent geologic feature in the area. Abundant trees near the roadways indicate higher elevations in these sections. Adjacent to the Intracoastal Waterway and north of the levee the project area is marsh. The remainder of the tract appears to be swampy.

Aerial photographs from 1958 indicate a decrease in marshland with an increase in swamp vegetation. The increase in drier land was likely due to the construction of drainage canals to the west of the project area. Almonaster Avenue had not been constructed. More development and associated clearing is apparent south of Gentilly Road. The 1958 photographs include Bayou Bienvenue, a well developed drainage south of the Intracoastal Waterway. Relict drainages are apparent throughout the area.

The next series of photographs were taken in 1967. A fairly large "L"-shaped drainage canal had been excavated in the project area. Much of the project area appears to be marsh and swamp (inundated). Small natural drainages cross the area. Much of the large timber has been felled, with the logs left in place. Areas adjacent to the roadways have been cleared and appear to have been leveled. It is likely that fill material was brought in to facilitate leveling.

Aerial photographs from 1972 show the construction of Almonaster and Grant Avenues, as well as a large facility which has housed numerous businesses [Locus "G" (see HTRW pp. 16)] south of Gentilly Road. Additionally, more drainage canals have been excavated in the project area. Vegetation in the area indicates a primarily swampy environment.

The most recent aerial photographs (1985) show few, if any, changes in the immediate project area. Continued construction and development has occurred to the east of Paris Road. Other photographs of the project area show the drainage canals which have been excavated in the area. Vegetation appears to be flood-tolerant species associated with swampy environments.

As noted in Chapter 2, the Bayou Sauvage lobe was well developed 1,800 years ago, and thus could have been the locus of prehistoric occupation. However, aerial photographs do not indicate the presence of large, long term sites such as those with mounds. With the wide range of resources available in the marshy/swampy environments along what was later a Na-

tive transportation route, the area may have seen considerable transitory occupations. Nonetheless, given the disturbance associated with construction of the Intracoastal Waterway, levees, canals, and facilities within the project area, it is extremely unlikely that short-term pre-historic sites would be recovered, particularly since such sites would have been located at ground surface.

Similarly, the potential for encountering historic sites in the project area is also extremely low. With the founding of New Orleans, settlement began around Bayou Sauvage to the north of the immediate project area. Historic sites which may occur in the area are associated with timbering, trapping, and plantations. The former two activities generally leave little archeological evidence of their occurrence, and while plantation sites leave more substantial remains, they generally are located within a relatively limited area as compared to the size of the plantation itself. Historic research indicates that plantation development was to the east and west of the project area. In addition, had historic occupation formerly been located within the project area, it is likely that construction destroyed any evidence of its presence.

CHAPTER 8

SUMMARY AND RECOMMENDATIONS

Background research was conducted for the project area. This research included a review of historic maps, documents, and aerial photographs, as well as a review of the geomorphic and geologic history of the project area. No fieldwork was undertaken. This chapter provides a summary of the available data and recommendations.

Examination of pertinent documents and historic maps (Chapter 5) indicated that the immediate project area was an unlikely location for historic archeological sites. There is no evidence of Native American occupations dating to the historic period. While the region was settled as early as the 1700s, historic habitations appear to have been located well to the east and west of the project area.

Aerial photographs of the area provide little evidence of archeological sites. Certainly there are no topographic features reminiscent of shell mounds or middens associated with prehistoric settlements. Substantial natural levees, suitable for occupation, do not occur within the project area. The photograph predating 1958 indicates structures within the project area just south of Gentilly Road. The buildings, likely homes, were destroyed by subsequent construction.

The geomorphic research for the project area indicates that no cultural resources older than a few hundred years are likely to be encountered in the project area. Conditions in the project area were not conducive to the survival of cultural materials from prehistoric periods. Archeological sites dating to the colonial period would be manifested by surface deposits. Such surface deposits would have been previously impacted by construction.

From these data, it is concluded that construction is unlikely to impact any archeological deposits in the project area. Development of a research design for archeological testing is unnecessary. No further work is recommended for the project area. However, if unexpected remains are encountered during construction, work in that area should be halted and the remains should be examined by an archeologist.

REFERENCES CITED

- Anonymous
1928 *A Glimpse Of The Past: A Short History Of Faubourg De Montluzin*. Manuscript on file, Louisiana Collection, Howard-Tilton Memorial Library, Tulane University, New Orleans.
- Bahr, Leonard M., Jr., R. Costanza, J.W. Day, Jr., S.E. Bayley, C. Neill, S.G. Leibowitz, and J. Fruci
1983 *Ecological Characterization of the Mississippi Deltaic Plain Region: A Narrative with Management Recommendations*. U.S. Fish and Wildlife Service, Division of Biological Services, Washington, D.C.
- Bahr, L.M. and J.J. Hebrard
1976 *Barataria Basin: Biological Characterization*. Center for Wetland Resources, Louisiana State University, Baton Rouge.
- Brown, Ian W.
1984 Late Prehistory in Coastal Louisiana: The Coles Creek Period. In *Perspectives on Gulf Coast Prehistory*, edited by Dave D.Davis, pp. 94-124. University of Florida Press, Gainesville.
- Casey, Powell A.
1983 *Encyclopedia Of Forts, Posts, Named Camps, And Other Military Installations In Louisiana, 1700-1981*. Claitor's Publishing Division, Baton Rouge.
- Chase, John Churchill
1979 *Frenchman, Desire, Good Children, And Other Streets Of New Orleans*. Third edition. Collier Books, New York.
- City of New Orleans
1981 *Master Plan For The Almonaster-Michoud Industrial District*. Manuscript on file, vertical file, Louisiana Collection, Howard-Tilton Memorial Library, Tulane University, New Orleans.
- Clark, John G.
1970 *New Orleans, 1718-1812: An Economic History*. Louisiana State University Press, Baton Rouge.
- Coastal Environments, Inc.
1981 *Cultural Resources Survey Of The Almonaster-Michoud Industrial District*. Submitted to the Division of Archaeology, Baton Rouge.
- Coleman, James J.
1968 *Gilbert Antoine De St. Maxent*. Privately published, New Orleans.
- Eustis Engineering Company
1984 *Geotechnical Investigation, Soil Stratification and Foundation Conditions for Residential Development, New Orleans, Louisiana*. Submitted to the City of New Orleans and Sewerage and Water Board, New Orleans.

Franks, Herschel A., Joann Mossa, Jill-Karen Yakubik, Ellen Weiss, Jeffery Treffinger, and Donald Gatzke

- 1991 *A Research Design for Archaeological Investigations and Architectural Evaluations Within the Proposed Upper Site, New Lock and Connecting Channels, Inner Harbor Navigation Canal, New Orleans, Louisiana*. Submitted to the New Orleans District, U.S. Army Corps of Engineers, New Orleans.

Franks, Herschel A. and Jill-Karen Yakubik

- 1989 *Cultural Resources Survey of Four Construction Items Below New Orleans*. Submitted to the New Orleans District, U.S. Army Corps of Engineers, New Orleans.

Frazier, D.E.

- 1967 Recent Deltaic Deposits of the Mississippi River: Their Development and Chronology. *Transactions of the Gulf Coast Association of Geological Societies* 17:287-315.

Gagliano, S.M., and R.T. Saucier

- 1963 Poverty Point Sites in Southeastern Louisiana. *American Antiquity* 28(3):320-327.

Gagliano, Sherwood M., Richard A. Weinstein, and Eileen K. Burden

- 1975 *Archaeological Investigations along the Gulf Intracoastal Waterway: Coastal Louisiana Area*. Submitted to the New Orleans, District, U.S. Army Corps of Engineers, New Orleans.

Gayarré, Charles

- 1885 *History Of Louisiana*. Three volumes. Armand Hawkins, New Orleans.

Giardino, Marco J.

- 1984 Documentary Evidence for the Location of Historic Indian Villages in the Mississippi Delta. In *Perspectives on Gulf Coast Prehistory*, edited by Dave Davis, pp. 232-257. University of Florida Press, Gainesville.

Goins, Charles Robert, and John Michael Caldwell

- 1995 *Historical Atlas Of Louisiana*. University of Oklahoma Press, Norman.

Gould, H.R., and J.P. Morgan

- 1962 Coastal Louisiana Swamps and Marshes. In *Geology of the Gulf Coast and Central Texas and Guidebook of Excursions*, edited by E. Rainwater and R. Zingula. Houston Geological Society, Houston.

Heddon, Wendell

- 1984 The Life and Times of Eastern New Orleans. *Gambit Business Quarterly*, February 4, 1984.

Jeter, Marvin D., J.C. Rose, I. Williams, Jr., and A.M. Harmon

- 1989 *Archaeology and Bioarchaeology of the Lower Mississippi Valley and Trans-Mississippi South in Arkansas and Louisiana*. Research Series No. 37, Arkansas Archaeological Survey, Fayetteville.

- Katz, Allan
1988 Stunted Growth. *The Times Picayune*, June 26, 1988.
- 1982 Almonaster Pot of Gold. *The Times Picayune*, August 8, 1982.
- Kniffen, Fred B., H.F. Gregory and G.A. Stokes
1987 *The Historic Indian Tribes of Louisiana From 1542 to Present*. Louisiana State University Press, Baton Rouge.
- Kolb, C.R., and R.T. Saucier
1982 Engineering Geology of New Orleans. In *Geology Under Cities*, edited by R. Legget, pp. 75-93. Case Histories in Engineering Geology No. 5, Geological Society of America, Boulder, Colorado.
- Kolb, C.R., and W.G. Shockley
1959 Engineering Geology of the Mississippi Valley. *American Society of Civil Engineers Transactions* 124:633-656.
- Kolb, C.R., and J.R. VanLopik
1958 *Geology of the Mississippi River Deltaic Plain, Southeastern Louisiana*. Technical Report No. 3-483, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Kolb, C.R., F.L. Smith, and R.C. Silva
1975 *Pleistocene Sediments of the New Orleans-Lake Pontchartrain Area..* Technical Report No. S-75-6, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Lora, Mary Elaine
1983 Fueling the Force Behind The Space Shuttle. *Louisiana Life* 3(5):58-74.
- Louisiana Highway Commission
1929 *Statement Of Facts*. Louisiana Highway Commission, New Orleans.
- 1925a *Report Of The Louisiana Highway Commission*. Louisiana Highway Commission, Baton Rouge.
- Louisiana State Highway Engineer
1918 *Report Of The State Highway Engineer Of The State Of Louisiana To The Board Of State Engineers*. Louisiana State Highway Engineers, Baton Rouge.
- Massa, Joe
1976 Orlandia Developers Facing Battle. *The Times Picayune*, June 6, 1976.
- Murray, G.E.
1961 *Geology of the Atlantic and Gulf Coastal Province of North America*. Harper & Brothers, New York.
- Neuman, Robert W.
1984 *An Introduction to Louisiana Archaeology*. Louisiana State University Press, Baton Rouge.

N.O. Times-Picayune

1967 Drainage, How It Works in New Orleans East. *The Times Picayune*, April 30, 1967.

1924 *The Watson-Williams Bridge Takes The Logical Route*. Advertisement, the *Times-Picayune*, December 1, 1924.

Pearson, Charles E.

1984 *Archaeological Evaluation of the Paris Road Site (16OR41), Orleans Parish, Louisiana*. Submitted to the New Orleans District, U.S. Army Corps of Engineers, New Orleans.

1992 *The Ouacha and the Chaouacha: The History and Archaeology of the Contact Period in South Louisiana*. Paper presented at the annual meeting of the Louisiana Archaeological Society, Baton Rouge.

Petersen, Betsy

1969 New Orleans East and How it Grew. *Dixie*, May 18, 1969.

Phillips, Philip

1970 *Archaeological Survey in the Lower Yazoo Basin, Mississippi, 1949-1955*. Volume 60, Papers of the Peabody Museum, Harvard University, Cambridge.

Quimby, George I.

1957 The Bayou Goula Site, Iberville Parish, Louisiana. *Fieldiana: Anthropology* 47:91-170.

Samuel, Ray

1959 *To A Point Called Chef Menteur*. New Orleans East, Inc., New Orleans.

Saucier, R.T.

1963 *Recent Geomorphic History of the Pontchartrain Basin*. Coastal Studies Series No. 9, Louisiana State University Press, Baton Rouge.

1994 *Geomorphology and Quaternary Geologic History of the Lower Mississippi Valley*. U.S. Army Corps of Engineers, Mississippi River Commission, Vicksburg, Mississippi.

Saucier, R.T., and J.O. Snowden

1995 *Engineering Geology of the New Orleans Area*. Field Trip Guide Book No. 6a & 6b, 1995 Annual Meeting, New Orleans, Louisiana, Geological Society of America..

Shenkel, Richard

1984 Early Woodland in Coastal Louisiana. In *Perspectives on Gulf Coast Prehistory*, edited by D.D. Davis, pp. 41-71. University of Florida Press, Gainesville.

Speaker, John Stuart, Joanna Chase, Carol Poplin, Herschel A. Franks, and R. Christopher Goodwin

1986 *Archaeological Assessment of the Barataria Unit, Jean Lafitte National Historical Park*. Submitted to the Southwest Region, National Park Service, Santa Fe.

- Stuart, Lettice
1981 New Orleans East Plan Gets Underway. *The Times Picayune*, October 24, 1981.
- Swanton, John R.
1952 *The Indian Tribes of North America*. Bulletin 145, Bureau of American Ethnology, Washington, D.C.
- Thomas, Prentice M.
1982 *Archaeological Investigations at the Linsley Site (16OR40)*. Submitted to the Port of New Orleans, Department of Planning and Port Development, New Orleans.
- The *Times-Picayune*
1976 Lazarus Awakened. *The Times-Picayune*, March 7, 1976.
- Toups, Emile
1986 The Sleeping Giant Awakes. *Celebrate*.
- U.S. Army Corps of Engineers
1984 *Mississippi and Louisiana Estuarine Areas: Freshwater Diversion to Lake Pontchartrain Basin and Mississippi Sound*. New Orleans District, U.S. Army Corps of Engineers, New Orleans.
- Warner, Coleman
1985 Growth Spurt Predicted for Eastern New Orleans. *The Times Picayune*, October 26, 1986.
- Watson, Thomas D.
1976 A Scheme Gone Awry: Bernardo de Galvez, Gilberto Antonio de Maxent, and the Southern Indian Trade. *Louisiana History* 17(1):5-18.
- Weinstein, Richard
1978 *Archaeological Survey of Gulf Outlet Bridge I-10 Spur Route*. Submitted to the Division of Archaeology, Baton Rouge.
- Weinstein, Richard A., Eileen K. Burden, and Kathy L. Brooks
1980 *Cultural Resources Survey of Interstate Route I-510, Orleans Parish, Louisiana*. Submitted to the Division of Archaeology, Baton Rouge.
- White, David A., S.P. Darwin, and L.B. Thien
1983 Plants and Plant Communities of Jean Lafitte National Historical Park, Louisiana. *Tulane Studies in Zoology and Botany* 24:101-129.
- Wiseman, Diane E., R.A. Weinstein, and K.G. McCloskey
1981 *Cultural Resources Survey of the Mississippi River - Gulf Outlet, Orleans and St. Bernard Parishes, La.* Submitted to the New Orleans District, U.S. Army Corps of Engineers, New Orleans.
- Yakubik, Jill-Karen
1990 *Ceramic Use in Late-Eighteenth-Century and Early-Nineteenth-Century Southeastern Louisiana*. Unpublished doctoral dissertation, Department of Anthropology, Tulane University, New Orleans.

Yakubik, Jill-Karen and Herschel A. Franks

1992a *Archaeological Survey and Testing in the Holy Cross Historic District, New Orleans, Louisiana*. Submitted to the New Orleans District, U.S. Army Corps of Engineers, New Orleans.

1992b *Archaeological Investigations at the Site of the Cabildo, New Orleans, Louisiana*. Submitted to the Louisiana State Museum, New Orleans.

1991 *Archaeological Investigations at 726-728 Toulouse Street, New Orleans*. Submitted to The Historic New Orleans Collection, New Orleans.

MAPS

Latour, Arsene Lacarriere

1815 *Map Shewing [sic] The Landing Of The British Army*. Copy on file, Louisiana Collection, Howard-Tilton Memorial Library, Tulane University, New Orleans.

Fidelity Development & Investment Co.

1914 *Versailles And Vicinity*. Copy on file, Louisiana Collection, Howard-Tilton Memorial Library, Tulane University, New Orleans.

Louisiana Highway Commission

1926a *Map Of Louisiana Showing System Of State Highways By Routes*. Baton Rouge.

1925b *Map Of Louisiana Showing System Of State Highways By Routes*. Baton Rouge.

APPENDIX I
SCOPE OF SERVICES

August 1, 1996

SCOPE OF SERVICES

A Land Use History and Cultural Resources Report for
Mississippi River-Gulf Outlet
New Lock and Connecting Channels, Louisiana

1. Introduction. The purpose of this delivery order is to produce a land use history in support of an initial hazardous, toxic, and radioactive waste (HTRW) assessment and a cultural resources report.
2. Study Area. The study area is marked on the attached map. (Attachment 1) Superfund sites and Resource Conservation and Recovery Act Treatment, Storage and Disposal facilities within one mile of the project area should be included.
3. Study Requirements. The study will be conducted utilizing current professional standards and guidelines for historical research, HTRW initial assessments, and cultural resources investigations.
4. Government Provided Information. Upon award of this delivery order, the NOD will provide to the Contractor pertinent information in its files regarding the study area. This information includes the Tobin database of oil and gas well sites.
5. Land use history
 - a. Background Information for land use history. Corps of Engineers guidance on HTRW aspects of water resources planning is provided in Engineer Regulation 1165-2-132. This contract effort will support an initial HTRW assessment (section 7 of the referenced regulations) now underway by New Orleans District personnel. The work to be performed under this delivery order does not include site inspections.
 - b. Study Requirements for land use history. The land use study will be conducted in two phases: Historical Research and Records Review and Data Analysis and Report Preparation.
 - c. Phase 1. Historical Research and Records Review. The first phase of this project will consist of comprehensive

literature research and records review to develop the land use history of the study area. The research will focus on land uses from 1900 to the present. Further, the research will concentrate on commercial and industrial uses since these are more likely to be associated with hazardous wastes.

Detailed information on residential land uses is not required, but the historic context of the study area must be established. Sources consulted during the research will include, but not be limited to, the following:

- (1) post-1900 historic maps and aerial photographs;
- (2) real estate and insurance records;
- (3) local and regional historic archives, city directories and other public records;
- (4) Federal, state and local industrial and commercial census records;
- (5) geological data and reports; and
- (6) formal contact with and/or inspection of applicable Federal, state and local regulatory/response agency records (additional information on agency searches provided below).

Oral histories and/or interviews with knowledgeable persons (e.g. public agency employees, local environmental advocates, residents, etc.) will also be conducted as appropriate.

Contact with and/or inspection of public agency records is intended to document license and permit actions, HTRW violations, enforcement actions, past or pending litigation, illegal dumping, and known contamination sites. The Contractor will consult with the Environmental Protection Agency (EPA); at a minimum, the Regional Site Assessment files, the CERCLIS inventory list, and the RCRIS inventory list will be checked. Louisiana state agencies which will be consulted during this study include, but are not limited to, those listed on Attachment 2. Additional agencies (not on the list) to be consulted include the Public Safety Services of the Louisiana Department of Public Safety and Corrections for information on spills and releases reported to the Hazardous Materials Hotline, and the appropriate parish Offices of Civil Defense or Emergency Preparedness.

Special attention will be focused upon oil and gas activities, pipelines, and industrial land uses. Information from the Tobin and DNR databases as well as other sources will be used to document well locations, areas of NORM concern, metering stations, unclosed pits, spills, and field pipeline systems in the study area. All pipelines within the study area will be documented with special emphasis on early, pre-regulation lines (e.g. pre-1959). Current industrial facilities in the study area will be an important focus of the research. However, the research will also address the historical practices of these facilities as well as now defunct facilities to identify areas of potential HTRW concern which would escape a cursory review of current site conditions.

The Contractor will deliver to the COR copies of relevant information obtained within four weeks of award of this delivery order in non-report format. This is not a preliminary report but simply delivery of data obtained to that point to the COR to be used in preparation of the draft Initial Site Assessment. Preliminary 24" x 36" enlarged plots of the project area will be included. This data will include when possible:

- (1) aerial photographs;
- (2) census records;
- (3) RCRIS (The Resource Conservation and Recovery Information System List);
- (4) CERCLIS (The Comprehensive Environmental Response, Compensation, and Recovery Information System List - Entries);
- (5) NPL (The National Priority List);
- (6) USTDR (The Underground Storage Tank Description Report);
- (7) SWF (The Solid Waste Facilities List);
- (8) LASRIS (The Louisiana Site Remediation Information System List);
- (9) Louisiana Dept of Natural Resources, Office of Construction, Injection and Mining Division;
- (10) CUP (Coastal Use Permits)

- (11) Real Estate and Insurance Records;
- (12) City Directories;
- (13) CERCLA Superfund files;
- (14) CDS (the Compliance Data System);
- (15) NPDES (The National Pollution Discharge Elimination System List);
- (16) AFS (The AIRS Facility Subsystem List);
- (17) FINDS (The Facility Index System);
- (18) U.S. Department of Energy;
- (19) U.S. Nuclear Regulatory Commission;
- (20) TRI (The Toxic Release Inventory);
- (21) LWDPS (The Louisiana Water Discharge Permit System);
- (22) IAS Files (Inactive and Abandoned Sites);
- (23) RML (The Radioactive Material Licensee List);
- (24) TESS (State Police Report of Hazardous Material Incidents); and
- (25) Louisiana Department of Health and Hospitals, Office of Public Health.

b. Phase 2. Data Analyses and Report Preparation. The historical data and information obtained from agency consultations will be sorted, categorized and evaluated in order to present an exhaustive, chronological discussion of the study area's land use history. The text will be organized by project areas as appropriate. The land use history report shall contain, but not be limited to the following:

- (1) A description of the project area and proposed government action;

(2) a discussion of research methods and analytical techniques;

(3) the types, sources, location, adequacy and availability of pertinent documentation;

(4) the analysis and interpretation of aerial photos and other remote sensing data;

(5) an exhaustive, chronological discussion of the study area's land use history. This history will culminate in a comprehensive listing and discussion of commercial and industrial land uses of potential HTRW concern. For each facility or location of potential HTRW concern, the Contractor will summarize all relevant information obtained through the historical research and agency consultations. The minimum acceptable data is the name of the company or facility, the dates of usage or operation, the type of business or activity, and its location. All other data gathered which may help to identify the types of chemicals in use, the disposal methods, the ownership or employees of the company or facility will also be provided.

(6) figures, tables, graphs, maps and photographs to complement the narrative, provide additional detail, and illustrate the layout of known or potential HTRW sites. Any plan maps showing locations of buildings and/or activity areas will be copied and provided in (or with) the draft report;

(7) an appendix listing all sources consulted during the research will be included in the report. Included in this listing will be the agency and/or organizational name, a point of contact, date(s) of contact, and a brief assessment of the research value of the source. Sources that proved to be fruitless shall also be listed;

(8) a separate appendix which provides a copy of correspondence with regulatory/response agencies, as well as printouts and other data received from these agencies, will be provided in the report; and

(9) as a separate deliverable with the draft reports, all areas and/or facilities of potential HTRW concern shall be plotted on Intergraph design files of the study area. The COR will provide the Intergraph base maps of the project area to the Contractor no later than four weeks after delivery order award. These maps will serve as the base map or reference file for the

Contractor's preparation of files delineating and identifying all potential HTRW problem areas in the study area. The details of the mapping effort (e.g. what levels for what data, line weights, database information, etc.) will be established by the COR when the base map is provided to the Contractor.

6. Cultural resources investigations.

a. Phase 1. Background research

The Contractor will gather all available information on the project area and place it in its historic context. The purpose of this phase is to predict the nature of the resource base in the project area. Background research will include a review of literature, maps and records to develop a comprehensive understanding of the area. This shall include but not be limited to a review of historic maps, aerial imagery, the State Archeologist's site files, the National Register of Historic Places, geological and geomorphological data, archeological reports, archives, and public records. No field investigation will be required.

b. Phase 2. Report Preparation

The report will synthesize the available information into a comprehensive study of the area. The Contractor will discuss the potential of the area to contain archeological sites. The report will include a research design for archeological testing in the project area if the Contractor concludes that there is potential for sites in the area. The Contractor's recommendation of the necessity of a research design will be approved by the COR before beginning its preparation.

If a research design is necessary, the Contractor shall synthesize all pertinent data and prepare a plan for the cultural resources effort required for Corps of Engineers work in the area. The research design shall include: a comprehensive synthesis of all data gathered in the first phase of the investigation, a detailed narrative and graphic presentation of archeological expectations for the study area including prediction of any sites that may exist in the project area, and a description of the historic context to provide a framework for the sites identified in the area. This discussion will establish the framework for future assessment of the National Register eligibility of sites in the area and detailed field methodology for intensive survey and testing of the archeological potential of the area. The proposed methodology will be sufficiently

detailed to implement future cultural resources investigations for this project.

7. Reports. The Contractor will prepare separate reports on the land use history and the cultural resources investigation. Four copies of the draft reports integrating all phases of this investigation will be submitted to the COR for review and comment within 8 weeks after delivery order award. Along with the draft reports, the Contractor shall submit two copies of a spiral-bound appendix containing copies of correspondence with regulatory/response agencies, as well as printouts and other data received from these agencies. Preliminary 24" x 36" enlarged plots of the project area will be included.

The written report shall follow the format set forth in MIL-STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) page size shall be 8-1/2 x 11 inches with 1-inch margins; (3) the reference format of American Antiquity will be used; (4) page numbering with Arabic numerals will begin with the first page of chapter 1 of the report. Spelling shall be in accordance with the U.S. Government Printing Office Style Manual dated January 1973.

The COR will provide all review comments to the Contractor within 4 weeks after receipt of the draft reports (12 weeks after work item award). Upon receipt of the review comments on the draft report, the Contractor shall incorporate or resolve all comments and submit one preliminary copy of the final report to the COR within 2 weeks (14 weeks after work item award). Upon approval of the preliminary final report by the COR, the Contractor will submit 10 copies and one reproducible master copy of the land use history and 40 copies and one reproducible master copy of the cultural resources report to the COR within 16 weeks after work item award. The Contractor will also provide computer disk(s) of the text of the final report in WordPerfect 6.0 or other approved format and copies of any spreadsheet, database, and Intergraph files developed during the project.

8. Attachments.

Study area map